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HORTICULTURAL DEPARTMENT

Dianthus.

Amongst the prettiest of flowers whose seeds should be sown now is the Dianthus Heddewigi. These belong to the same family as the carnation and picotee, and in many ways their cultivation is the same. They are annuals, and necessarily must be sown every year, but the beauty of the flowers, the length of time they are in bloom, and their scent make them one of the finest annuals that can be grown—rivals, in fact, of that popular favorite, the phlox.

There are numerous varieties, all equally beautiful, and a glance at any of the catalogues issued by the various seedsmen will give an idea of the good points of each. In small gardens, where the space that can be devoted to them is somewhat limited, a packet of the "best mixed" would perhaps be the best investment; but in places having more room and where it is possible to plant each variety of annual in a bed to itself, a collection of the different kinds so planted is both effective and interesting. Raise the seed in boxes, sowing thinly and covering with fine soil until none of the seeds are visible, and water and keep watered with a fine rose can until the seed is up. The plants grow quickly, and must be pricked out into boxes and pots when six leaves or so are showing. Let them become well established in these before you think of planting out. Too small plants are demolished by the slugs in a single night. When transplanting place the plants not less than 6in. apart, and dust the bed with lime every evening until they have attained a fair size, when the slugs will no longer hurt them.

This dusting with lime is one of the most efficacious ways of ridding the garden of slugs. The lime should be exposed some hours to the atmosphere to allow it to become "air slaked," and then placed in a bran bag. One shake over each plant will be quite enough each night. The lime itself will do no harm either to the plant or the soil; in fact, in many cases it is a very necessary manure. The only thing is that it gives the beds a very untidy appearance, but this can scarcely be helped unless a little soot be added to the lime, an addition that adds materially to the value of the dusting as a manure.

— Liquid Manure. —

A little liquid manure (always remember to give it weak) given once or twice is very beneficial to these annuals, making the blooms both larger and richer in color.

— Other Varieties. —

There are two other varieties of the dianthus tribe that seem to have gone out of popular favor, but which, nevertheless, have many good points that make them desirable plants for a mixed border. They are the Dianthus plumarius or pink, and the Dianthus barbatus or Sweet William.

The former of these is just splendid for bouquets, buttonholes, sprays, etc., being not too large and beautiful scented, and what scent can compare with that of the carnation tribe? The seed, like that of all varieties of the dianthus, germinates extremely well, showing above the surface in less than a week if it be fresh. Treat the seedlings similarly to "heddewigi," and when large enough transplant in groups of three or four into the mixed border. At the end of the blooming season the best of them may be propagated by division of the roots or by cuttings. These latter we treated like carnation cuttings, putting six in a 5 in. pot, filled with a sandy loam (three parts sand, one part loam), placing them round the edge. The cuttings must not be too large, say, 2½in. long. In three weeks or a month they will probably be sending out rootlets, when they must be potted off singly, and when the roots reach the edge of these fresh pots it were best to transplant them straight away into the border, unless they are to be utilised as pot plants for table decoration indoors.

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Have a Plan.

A carefully prepared plan should precede all attempts in gardening even for a small villa garden. It pays to do well whatever is done in gardening. In starting such work it is too often undertaken without any thing like a definite plan. It would be quite as reasonable to work without a well considered plan in building our houses, yet we find that large sums of money in the aggregate are paid to architects for house plans while to the surroundings little thought is given to calling in the services of the trained gardener. When the day comes that the gardener will be consulted along with the house architect in matters of home improvement, then a less sum of money will go farther to the purchase of real beauty, pleasure and comfort than when the latter is alone employed.

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The Private Gardener.

The term is one in common use and well understood to distinguish one who has charge of a garden or grounds and cultivates vegetables, plants and flowers, not to sell, but for the use of those who employ him to do this work, or one who works for his own pleasure and profit. The gardener assists and directs nature in producing everything which grows out of the ground for man's use; for the gratification of his palate, and which is capable of administering to his sense of beauty. His work is to provide not only food for the body but also "Food for the Soul." We sometimes see an advertisement in the daily papers like this—"Wanted, a gardener who understands care of horses," or "who can milk." Such an advertisement is a sad abuse of the word; what is wanted is a handy laborer, or man of all work; much that I shall say cannot specially be applied to him. Of the private gardener it may be said that he is likely to play a part of continually growing importance. His influence on the future of Horticulture is powerful for good or for evil. If he be a capable, energetic and honest man, he will do such work as will make his employer a patron of gardening, and if he be ignorant, careless and dishonest he will not only ruin himself, but will damage the cause he misrepresents.

To the gardener who wants to improve himself, books are a paramount necessity. Cultivate a love for books; it is a habit that grows by indulgence; as the fondness for books grows you can add to your library. All study should not be confined to indoors or even to a garden only for a gardener should study natural landscapes so as to readily apprehend their points of beauty and their beauty as a whole, and then with "The art that doth mend nature" put the finishing touches thereto.

Every garden may be made more interesting by excelling in some specialty; every gardener should have a hobby. If the place be a small one and your opportunity meagre, take in the flower line, Pansies, Verbenas or Phlox, Stocks, Cyclamen, Cineraria, etc. By saving your own seed, carefully selecting, year after year, the finest, it is astonishing how you can improve the varieties in any species. Like results follow a similar course in vegetables. Or if your place and opportunity are greater start for instance making a collection of shrubs in groups or in single specimens; or a collection of roses, or of the larger herbaceous perennials. You will find in a few years your constant and careful pursuit of your hobby will result in making you and the place you represent, more or less famous, and your application to work along a special line will enable you to give valuable points to your fellows. As Emerson says "If you make shoes better than anyone else you will find a path beaten to your cottage door."

It is profoundly interesting to study how new varieties come. Nature works, often we know not how, in bringing forth new varieties, the influence of heredity undoubtedly prevails to some extent and instances are not wanting to show that it does. But, while man can do something in breeding from types, nature is always at work and often produces, we know not how, valuable "breaks" in seedlings or sports, which are frequently lost because the gardener fails to recognize their merits and propagate and perpetuate them. Private gardeners have done much in the past to preserve and propagate good new things and should be ever on the alert to take advantqge of any opportunities along this line which kind nature may afford. The famous Seckel pear was a "chance" seedling found growing along the roadside and man had no hand in its origin, but some one should receive the blessings of generations for preserving it.

Now, a few words on the importance of industry. From the very earliest times, the great men have extolled the value of industry. "Go to the ant thou sluggard, consider her ways, and be wise" has served for the text of many a powerful sermon; the expression that "Genius in only an infinite capacity for work" has been endorsed by many thinkers. Napoleon said "I have never found the limit of my capacity for work." In short, the men who have made their mark in the world have been at a loss for words to express themselves strongly enough on the subject. Don't be afraid of work and if you are an employee don't forget that "Folks who never do more than they are paid for, never get paid for more than they do." Let not the amount of pay be your main consideration; rather see how much and how well you can do the work; the real reward that life holds oue for work is the increased capacity to do more and better work, and consequently greater satisfaction and enjoyment.

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Pleasures of Gardening.

The fellows who work in the fresh air amid the growing flowers are to be envied. They work with their hands and gain a glorious appetite, and if they work with their heads the result is seen in better flowers, choicer varieties or improved sorts. Nature lends a helping hand and from the common weeds of our forefathers have been evolved the priceless beauties of to-day. Surely work with such surroundings ought to bring out the best there is in any man's mental or spiritual being.

What can be more interesting then to watch the seed swell, become a living plant, put forth roots and branches, develop leaves, bud, blossom, seed and decay. Isn't the evolution of life in human, animal or vegetable kingdoms the most interesting thing possible on this old globe of ours? And when you assist Nature in the development of life and beauty aren't you more interested than when you are chasing facts and figures in an office?

Someone has aptly said, "The undevout astronomer is mad," and it might truthfully be said, "The unbelieving gardener is mad." Perhaps I may be called a "sentimental old maid" for expressing these thoughts, but I will go farther than the old maid and say that any gardener who is not in love with his work ought to get out and stay out.

If every gardener would learn to grow one thing well at a time, and strive to do better than the other fellow, what a vast improvement in quality and quantity there would soon be. I know of no field of human endeavor where the chances for development are greater than in this. If some ambitious florist had not tried to improve on the old-fashioned "pinks" we would have "pinks" to-day instead of 4-inch carnation blooms. If some enthusiast hadn't put time and thought on the small chrysanthemums of a generation ago, we wouldn't have them to-day as large as dinner plates. So it is in every line of plants or flowers, so do you grow them a little better than your neighbor?—"E. J."

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Open Border Notes.

Plant out hardy annuals and perennials, selecting a favourable day and proper state of soil for the purpose—nice friable soil which will crumble when pressed by the hand without forming a clod.

Take up Dahlias, when mature, and store away in a dry place till winter is over.

Planting bulbs and tubers should be finished this month, such as Hyacinths, Tulips, Ranunculus, Anemones, Crocus, Ixias, Narcissus, Snowdrops, etc.

Roses of all kinds should be planted at once—the sooner the better—but pruning may be deferred till next month. Cuttings should be put in as early as possible, as they root much better than if left till late in the season.

Layer Carnations, Picotees, Pinks etc. Cut all Chrysanthemums to the ground after flowering; take up the plant, pull it apart, and replant as many of the strongest shoots as may be needed. The soil should be rich, and of a rather loose sandy nature.

Sowing seeds of hardy annuals and perennials in pots or boxes may be still continued, placing them in a warm situation, and covering with a pane of glass.

In large gardens, where there is room, some of the special kinds, such as Pansies, Phlox, Ten-week Stocks, Dianthus, etc., may be planted in beds by themselves, in order that, being away from the roots of other plants in mixed borders, particular care can be devoted to their cultivation, so that finer flowers may be produced than it would be possible to get in mixed beds. Sand and manure mixed with the soil would also help to improve their flowers.

Fairy Rose, Box, and other live edgings should now be put in.

Lawns which have become brown may be improved in appearance by being sown with rye-grass, which will soon form a nice green sward for the winter. Plots that have been laid out for fresh lawns should also be sown with this grass, which would look well during the winter months, and can be dug in in the spring time, when the permanent grass (whether Couch or Buffalo) should be planted. Nothing is gained by planting these now, as they do not grow till the warm weather sets in.

Cuttings of evergreen and deciduous shrubs of nearly all kinds should be put in now.

Camelias, Ericas, etc., should be planted in some nice sheltered place, where there is plenty of light and air, but should be protected from the winds. Avoid lime when planting these.

Under Glass.

As Primulas begin to show bloom they may be brought from the shadehouse or frame into the greenhouse, where a display of bloom may be kept up throughout the winter months. These very useful plants may also be grown with success on the balcony or window, and should be watered occasionally with liquid manure, which greatly improves the flowers and foliage.

Cinerarias, Calceolarias, and Mimulus should be kept growing, and also Petunias, some of which may now be showing flower. They should be potted in good rich soil, and not allowed to become dry.

Young Fuchsias should be struck and potted off as speedily as possible, as they are superior to old plants.

Coleus should now be put in the warmest place, and should the greenhouse not be warm enough, they may be kept in the dwelling house window.

Chrysanthemums which are now out of bloom should be cut down, and turned out in the open air.

Tuberous-rooted Begonias which have finished flowering should be placed under the stages for a rest.

Zonale Pelargoniums should now be potted for late winter blooming. Successional batches of these potted at various intervals will al-

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Those contemplating purchasing a Motor could not do better than inspect this car, it being the Latest Model and in perfect running order. I am prepared to take £100 less than Cost.

Price Complete: £185.

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ways give a good display of bloom, but should not be allowed to flower until fair-size plants have been attained. Cuttings of these may now also be struck for later blooming.

Show, Regal, and Fancy Pelargoniums are now making their growth, and if attacked with aphides must at once be fumigated with tobacco. As soon as the roots reach the sides of the pots they should be removed into pots of larger size, mixing some bonedust with the compost, and potting tolerably firm. Admit all the air and light possible, and tie down any crowded branches, so as to cause a dwarf-spreading growth.

A second lot of Cinerarias and Calceolarias may now be potted for later blooming, and should be kept in a moderately cold close frame. Mimulus also require the same treatment.

Achimenes and Gloxinias are now going to rest, and should be very carefully watered, taking care not to give too much, in which case the tubers rot. Caladiums which have gone to rest may be shaken out and potted in clean pots and soil, placing a little sand around the tubers, and placed in a warm dry place, giving but very little water during the cold months.

The temperature of the warm house should not be allowed to fall below 60 degrees by night, and a little air admitted during fine days.

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In the Home of the Bulb.

Holland is famous the world over for the production of bulbs, and visitors to that country who are interested in horticultural matters always make a point of inspecting some of the leading bulb growing districts there. The town of Haarlem is the centre of the great bulb industry. When travelling by rail in that district one passes mile after mile through fields of tulips. As there are no hills, consequently there is no need for tunnels or cuttings, so that there is a complete and regular view of the country all along the line. The vastness of the area devoted to hyacinths and other bulbs gives an idea of the magnitude of this branch of the horticultural productions of the Netherlands. The deep sandy loam and the climate of the north-east of Holland form ideal conditions for raising bulbs of the best types. New varieties of hyacinths are produced from seed, and when one of good and distinct quality is procured, it is named and enrolled in the select list. There are now thousands of distinct varieties. Hyacinths thrive best in situations affected by sea air, and, in Holland, continue to produce strong flowers for several years. Although a few are raised in England and Ireland, for all practical purposes the Dutch farmers supply the whole world, and many millions of this favourite spring flower are exported by them annually.

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Ventilation in Greenhouses.

A free circulation of air is essential to the health of most greenhouse plants and, therefore, the means of giving air to an ample extent should be at command; otherwise, the structure being light, the sun's rays would frequently raise the temperature too high for greenhouse plants, and it is better to keep down the temperature by a free circulation of air than to exclude the sun's rays by shading. It is admitted that ventilation through numerous small apertures is better for the plants than the same quantity of air through a few large openings; therefore, the laps of glass should be small and well fitted, but not puttied, so that an interchange of fresh air may go on night and day through the interstices of the laps.—Echange.

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BRIDLES.—Good Useful Snaffle Bridles, 6/6, 9/6. Queensland, 8/6, 9/6, 10/6, 11/6, 12/6. Double Rein, 10/6, 12/6, 14/6, 16/, 18/. For Solid Nickel Bits add 3/, and Curb 4/6. Ladies' Double Rein same Price, only add for Round Reins, 3/, and Noseband, with Net, 2/6. Head-Stall Bridles, with Reins, strong 10/, 11/, 12/.

STRAPS.—Saddle Straps from 6/, doz.; Hobble Straps, 9d. 1/, each. Rings, 4d. 6d. good quality.

REINS, Single Cart, strong, 7/6, 8/6; Spring Cart 7/6, 8/6; Leading, 11/6 for 25 feet, 16/ for 36 feet; Cross Reins, strong, Waggon, 12/6, 13/6; Cross Reins, Buggy, Silver Buckles, best 14/6, 15/6. For folded hand parts add 6/ Bridle Reins, 2/6; Silver Buckles, 3/6.

HARNESS.—Carriage Harness for £15 up Best. Pair Horse, with pads, from £10 up. Pair Horse Ordinary Skeleton, Traces sewn in Hames, 120/, including Pole Straps; with Buckles in Hames, £6 10/, £7, £8, £9. Single Buggy or Trap Harness, you can have as low as £4 10/, but if you are wise don't go below £6, £6 10, £6 15, £7, £8, £9, £10, £11, £12. Best Value, and really a splendid line is £8. Spring Cart, with Square Saddle, £5 10/., £6, £6 10/, £7. Long Saddles, 5/ extra.

CART or DRAY HARNESS.—Saddles 22/6, 25/- and 27]6; Breeching same price, 22/6, 25/- and 27/6; Shaft Belly Bands, 6/6, 7/6; Leading Belly-Bands, 3/, 3/6; Iron-cased Hames, 5/6, 6 6, 7/6, 8/6. (Really Good); Hame Straps 9/ per doz., or 10d. each; Cart Winkers, 8/6, 9/6; Patent, 10/6; Queensland Pattern, 11/6, Plough Backbands, 5/6, 6/6, Spiders, 7/6, 8/6;9/6; Best Chains, 5d. 6d. lb.

COLLARS.—Faced with Hair, Best, 17/, and 18/; Leather Lining, 19/, 20/ Round, 17/; Faced with Hair, 18/; Spring Cart, 17/; Patent Leather, 20/, 22/6; Yankee Chaff 17/, 19/, 20/.

KANGAROO THONGS, good 1¼ yard, 1/; 1½ yard, 1/4; 1¾ yard, 1/8; 2 yards, 2/. 6 plait, 8 x 8, Stock Thongs, 6/6, 7/6, 8/6;

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Progress in Geraniums.

The Zonal Pelargoniums are mostly natives of Cape of Good Hope, a few from Australia. Few subjects that have ever been taken in hand have so richly and liberally rewarded the hybridist's labor. The great number of varieties listed in the catalogues embraces a range of form and color that is truly astonishing and bewildering, says a writer in "Horticulture," and the number is being added to, each year. It would seem every year as if the height of perfection had been reached, and yet when we see the results of the hybridizer's art in the new introductions each season we must confess that there is an improvement in many ways. What the future will be no one knows.

It would be difficult indeed to name a more universally popular flower than the "Geranium," or Pelargonium zonale with its allies, the Scented, Ivy Leaved and Fancys. The rose, the carnation, the chrysanthemum and other more or less popular flowers may all have their special seasons to fill, but it is for the Geranium to be everybody's flower. Everywhere and at all times, the joy alike of the rich and poor, the old and young, wherever civilized man may make his home, the Geranium is there to cheer and brighten by its presence today the same as it did in our grandmothers' time.

In the home of the tenement dweller we find it struggling for existence and succeeding well at the only window in the room. Perhaps the sun rarely if ever shines there, but yet, from early spring until long after the frosty nights have been followed by winter's death and destruction of all that is beautiful in nature we find the Geranium is still there, blooming to gladden the heavy hearts and revive the drooping spirit, and when trouble comes or cares oppress, it is often the only beam of sunshine that enters the dreary home.

In the conservatory of the wealthy we find the Geranium grown to magnificent specimens, that are a wonder to behold, masses of the most vivid scarlet dazzling to the eye, or covered with flowers of the most exquisite marking or blending of colors that win enthusiastic admiration from even the most careless observer. As a summer bedding plant there is nothing that can take the Geranium's place. In the spring we have flowers; flowers everywhere, beautiful beds of hyacinths and tulips which in a few weeks are gone, to be followed by a magnificent display of shrubbery that makes our home look indeed like a paradise, but how soon they fade and their loveliness has passed away as the dream of the night. Then the roses come. With gladness we hail the "Queen of Summer" and the air is made fragrant with her presence. They are beautiful indeed but how soon they bid us adieu, and in their place we have an abundance of green bushes and vines. It is so all through the entire category of summer flowers — anticipation, then realication for a short time, and then disappointment. It is then that we turn with a longing eye to the Geranium, as something we can depend on to fill our empty vases and window boxes, and beautify our lawns, from the time they are planted in the early spring until cut down by the late frost; even then if they are dug up and given a favorable opportunity they will continue blooming all through the winter. The Geranium is the one friend that we can depend on to stay with us and to always "make good."

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Bush-House Management.

— A useful paper on the "Culture of Ferns and Foliage Plants" read before a Queensland Horticultural Society: —

The first item is to have clean pots, even if pots are new it is a mistake to think they are clean and ready to put delicate plants into. Place the pots into a tub or small tank of water for two or three days; then give them a good scrubbing, and place them out in the sun for a week. Pots that have been in use a while become covered with a slimy green growth; remove the plant into a clean pot, then plunge the pot into hot water and scrub, afterwards rinse in clean water and place in the sun. When you receive the plants from the nursery, they are generally root-bound, through being raised in very small pots and left in them. so that the expense of freight is less when sending out. Take the pot in the left hand and tilt slightly; then with a piece of wood gently push the plant out, or the pot can be turned upside down and the plant taken out by knocking the pot gently against a bench, always having your fingers through the plant to prevent it from falling. Then start gently at the bottom of the ball of roots and gradually work out the broken crocks and charcoal; then most of the soil. By doing this the roots will be spread out and quicker, and better growth will be made; also you will be able to pick out any worms, etc., that, if left in, would soon affect the drainage and have to be repotted, or the plant would soon suffer. Do not put the plants (which when you received them were in 3-inch pots), into a 10-inch pot; this is a big mistake; put them into a size larger pot; and as long as the plant is doing well let it alone or until you see the roots peeping out of the bottom of tbe pot. When repotting, press the soil firmly, and stand the pot in a tub of water—enough water to reach the rim of the pot. You can leave it there until you have another pot ready; by doing this you saturate every particle of the soil. In the summer time plants need to be watered every evening; if you miss any, you will notice it the next evening by shrivelled-up foliage. In the cooler weather water them every second day, in the morning. It is better to water the plants with a can without the sprinkler for the majority of the ferns; by doing this you can give every plant just what it requires; if using a hose, the tender fronds get broken, and if the water is dirty, the mud sticks to the leaves and spoils the beauty of their foliage. If the ferns or plants are in a basket, soaking them once a week will be found beneficial. I find that ferns thrive much better when in baskets,

KEMP'S CHAMPION ROSES.

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A large stock of all the BEST NEW VARIETIES.

CARNATIONS: 5,000 plants of the best and most up-to-date sorts ready for immediate delivery.

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which are easily made with galvanised wire and wire-netting, and the basket lined with peat, fibre, or tea-tree bark, with a liberal amount of charcoal near the bottom to keep it sweet. I have never used liquid manure in the bush-house; if this is used, it should be made very weak, and the plants watered with clean water before and after using. Saltpetre is recommended as the best of all chemical manures for plants—a teaspoonful to a gallon of water. When mealy bug or scale make its appearance on the plants, lay the pot on its side, and wash the affected parts with soapy water applied with a sponge. By laying the pot on its side, none of the liquid will run down to the roots and injure them. Palms suffer the most from the black scale; a little boiled starch painted on the affected parts will take the scale off and do no damage to the palm if done carefully. Palms are one of the bush-house plants that need the foliage watered as well as the roots. When worms are in a pot, they will come to the surface if the pot is plunged into a solution of lime and water, they can be then picked off.

◆

Palms.

These beautiful decorative plants may be bought in small three or four inch pots at a very low price, up to the large specimens in ten or twelve inch sizes, when the cost runs into guineas. When a palm is purchased at, say, 1/- or 2/6, and it gets into bad health through some mismanagement, no serious loss is incurred if it is thrown away and replaced by a fresh, healthy plant; but one gets attached to plants, as we do to animals, and we are reluctant to throw our pets away. Ill health is often caused by injudicious watering, by exposure to cold or draughts of air, by not keeping the foliage clean and fresh, from want of spraying or sponging. A palm that has become browned and unhealthy may be restored by a little commonsense treatment, but the assistance of a green-house or glass-frame would be necessary, and also a supply of proper compost for it to feed upon. We have known small, shabby, brown-edged palms transformed into vigorous green ones by turning them out of their pots, washing the roots, and repotting them. The roots of most palms are brittle, and care must be taken not to bruise them, but any decayed parts should be carefully removed with a knife. If scale or bug be present the insects must be dislodged before the repotting. A close, somewhat warm atmosphere is necessary for the re-establishment of the treated plants. For the general repotting of palms, early spring is the best time, but in the case of unhealthy plants, or plants starved through want of root-room, any season of the year may be considered suitable. Scale insects on a few plants only may be destroyed by rubbing them off with an old tooth-brush dipped in soapy water, or in very weak kerosene emulsion. But if a number of plants have to be treated, it would be better to use Gishurst compound, or some other reliable insecticide, which all seedsmen keep. Mealy bug may be dislodged by spraying the plants with strong soapsuds and kerosene, say 7 oz. of the latter to three gallons of the suds; or, if the insects be just touched with the kerosene or with spirits of wine, the pest will be destroyed.

The fibre named raffia, now so largely used by gardeners for tying purposes, is the product of a species of palm. There are several kinds of raffia or raphia. R. toedigera is found, only on the banks of the Lower Amazon and Para rivers, in Brazil. It is called the Jupati palm. It has cylindrical leaf-stalks, which measure 12ft. to 15 ft. in length, and are used for a variety of purposes. The walls and partitions of houses are often constructed of the, while baskets, boxes, etc., are made of strips of the smooth outer portion. Another variety is a native of Madagascar. It bears gigantic pinnate, spiny leaves, often 50 ft. or more in height, so that the entire trees are sometimes 60 or 70 feet high. The fruit spikes weigh as much as 300 lb., and bear a large number of one-seeded fruits, rather larger than eggs, covered with shining scales. R. vinifera, the "bamboo palm," produces the valuable Piassava fibre, and is found in great abundance in Liberia. The fronds, or branches, of the tree are cut up into the desired lengths, and placed in water—preferably running—to remain until all of the substance except the fibre has decayed. When sufficiently decayed the branches are beaten until the fibre is free of all extraneous matter, then cleaned by being drawn through nails closely driven in a board rack. After being sundried, the fibre is ready for market. Its value in Liverpool is about £21 per ton. Piassava fibre is chiefly used in making brushes and brooms, also for baskets, street-sweeping machines, cordage, bottoms of chairs, as well as for tying. The fibre is very strong, and well resists decay. The tree produces a nut with a hard outer covering. It is called an ivory nut, and is made into rings. Palm-wine is also made from the tree.

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Nerine Fothergilli Major.

One of the most brilliant features of a meeting of the English Horticultural Society held last autumn was a group of this South African Amaryllid, contributed by Messrs. Veitch of Chelsea. Each pot carried several spikes or heads of blossoms, the number of the whole being about 150. All the Nerines are very beautiful, writes a correspondent to "The Garden," but the dazzling scarlet of this entitles it, I think, to premier position. Other points in its favour being its freedom of flowering and good constitution. This particular form is by botanists included under the head of curvifolia, but it is more generally grown as N. Fothergillii major. The "Dictionary of Gardening" gives the date of this introduction as 1788, so that it is by no means a new plant. For all this, it is not often seen in gardens. Its cultural requirements are not exacting, yet, at the same time, a few items need to be rigidly adhered to. In the first place, it resents being disturbed at the roots, and flowers best when several bulbs are closely packed together. Owing to this the soil should be of a good, lasting nature, such as will keep sweet for years. Good fibrous yellow loam and sand should form the staple portion of the compost. Thorough drainage, too, is essential. Next, it must be borne in mind that directly after the flowers are over the leaves are pushed up, and the plant makes its growth through the winter and early spring, so that throughout this period a light position in the greenhouse must be assigned it. For the production of a liberal display of blossoms it is very necessary that the bulbs have a good roasting during the summer when dormant. As an illustration I may refer to the particular specimens shown, for during a visit to Messrs. Veitch's nursery at Feltham on August 8 last I noted them all standing in a frame with the lights on to prevent any rain reaching them, yet tilted to admit plenty of air, and fully exposed to the sun. Under these conditions, to which they had been subjected without any water for about two months, the soil was, as may be imagined, absolutely parched, yet even then two or three of the earliest spikes were beginning to show." Members of this family grow well with us in the open garden and are, in fact, amongst the most beautiful of the summer and autumn flowering bulbs.

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Fruit Notes

— Reminders. —

Prune fruit trees, taking almonds peaches, and other stone fruits first.

Sow almonds, also stones of peaches, apricots, plums, etc., and pips of apples and pears for stocks for budding; also all kinds of nuts may be sown.

Towards the end of the month begin grafting blight proof roots for apple stocks.

Clean all loose bark from fruit trees.

Commence planting apples, pears, almonds, peaches, and all deciduous fruit trees.

In suitable localities, i.e., the hills and cool districts, plant gooseberries, currants, and raspberries.

Plant cuttings of figs and mulberries.

Do not delay in spraying peach and any other stone fruit trees for gumming blight wherever this very serious disease has made its appearance.

When planting almonds do not forget that it is important that at least two or three varieties should be planted in alternate rows or blocks. There are few better or more profitable things for break winds than the almonds, for the fruit is always saleable. When set out as a breakwind the distance apart need not be more than sixteen feet apart each way. If a triple line is to be planted the trees of the middle row should be set between those of the outer rows. When in blocks, plant twenty to twenty-four feet each way. Almond trees pay as well for shaping and pruning as do choicer kinds of fruit trees.

In buying young trees do not worry so much about the top as about the roots. A good well-grown head is, of course, desirable, but good fibrous roots should be considered essential. In planting the greatest care should be taken to avoid exposure of the roots to sun and wind from the time the trees are lifted in the nursery till they are planted. Protect them in all ways possible for a good deal of the after success of the young tree depends on the way it is handled at this time, yet reasonable care in this is too often neglected, with the result that the tree receives a serious set back.

Few plants respond more liberally to manures than does the vine. Vignerons do not adopt a uniform practice but in giving a dressing at the rate of up to two cwts. of superphosphate and one cwt. of sulphate of potash immediately after pruning and hoeing, or ploughing it in, with a light application of nitrate of soda later on, one can be assured of satisfactory results.

The pruning season brings many perplexities to the amateur fruit growers. Take buds, for instance. Individually they are insignificant things, yet are vastly important. Every reader probably knows that there are two distinct kinds which each have their special use. It is generally, but not always easy to distinguish between them. The round, somewhat plump buds, may produce fruit. The smaller, pointed buds will never do so, their mission being to produce wood and foliage only.

Someone has said that it is better not to prune at all than to prune unwisely; it is certainly better not to prune at all than to butcher the trees.

Keep in mind the type of tree wanted, i.e., one not too high, open in the middle, with well spread, evenly placed arms, and as much young fruiting wood of moderate strength from the bottom to the top as the tree will safely carry.

In peaches which fruit on wood of the previous year's wood, especially with the early varieties, it is considered by some pruners to be a good plan to prune moderately at the winter pruning, taking out old, useless and badly placed wood, and any rank growing upright shoots, but leaving the final cutting till the fruit is setting. With trees which drop their buds and are shy bearers it is undoubtedly a good plan.

Some pruners go systematically over a tree and shorten all the short twiggy wood irrespective of position or the buds the wood is carrying. This is probably about the very worst style of pruning, for some varieties bear principally at the end of these growths. In such cases where a limb has, say, ten to twenty laterals, it is best to cut out, say, half to a base bud, that is the one nearest to the main limb and leave the others alone, selecting for this those which show the best buds. The limb would, no doubt, look more shapely if all the laterals had been trimmed, but little or not fruit would have resulted. And what one wants is fruit, not appearance. The growth from the base buds this season will provide wood for next year's crop.

To sum up one might say that it is good policy to treat the tree as a whole first and then go over each branch and treat it individually, studying its fruiting possibilities and using the knife accordingly.

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The Bitter Pit Question.

The great interest felt throughout the Commonwealth in the original announcement telegraphed from Melbourne, that the cause of the disease known as Bitter Pit, had been discovered was very much modified when it became known that this alleged cause was Arsenate of Lead. Naturally the first question which occurred to the orchardist of more than a few years' experience was, How can that be, when Bitter Pit was known for years before Arsenate of Lead came into use as a spray material? This question which embodies an indisputable fact completely disposes of the theory of Arsenate of Lead, at least, as a sole cause. So far nobody appears to have tried to answer it. A second question would be, How is it that unsprayed fruit and fruit from trees which have never been sprayed, show the

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pitting at least equally as badly when grown under similar conditions? This, if more evidence were necessary, would also appear to settle the sole cause theory, unless we assume some mysterious agency of communication and infection (a pitted apple won't infect its next door neighbour) often across scores of miles of country. Not only so but there are many others equally difficult of solution. As for instance the varying degree in which pitting takes place in different seasons and in different varieties following the use of the same spray, at the same strength, applied at the same time, etc. The case for the defendant is certainly a strong one.

It is not a new theory, for from the very nature of the disease as generally understood, the orchardist of average intelligence first looked for some external cause, either artificial poison, as by spraying—indeed we recollect reading some correspondence on the subject some years ago, in which this possibility was discussed—or natural poison injected into the fruit by some unidentified insect, but both possibilities have long been dismissed by practical orchardists as the result of careful observation.

At the same time any pronouncement by Dr. Ewart, backed by our own State expert must command respect and merits the most careful consideration and painstaking investigation. This may well be granted without approving of the extreme step taken in suspending the proposed Federal-State enquiry which, it had been arranged should be carried out under Mr. McAlpine's direction.

We have not yet had an opportunity of seeing the full text of Dr. White's paper, read, and of course supported, at all events in its broader conclusions, by Dr. Ewart, at a meeting of the Victorian Royal Society, but judging from summarized accounts one might be justified in suggesting the substitution of the word "premature" for "preliminary contribution" with which, it is only just to mention, it was prefaced.

The only direct evidence of any apparent value quoted, is the observation made by Dr. Ewart at Box Hill in his own orchard, in which the trees were divided into two lots—one being sprayed, the other not sprayed—the result was that "whilst the majority of the trees in the sprayed portion produced a greater or less number of pitted apples, not a single specimen was forthcoming from the unsprayed portion." This is interesting and would be conclusive—would justify the finding of the committee on whose report the Federal-State enquiry has been shelved—were it not that the apparent conclusion is contradicted by experience.

No doubt the committee referred to, Dr. Norris and Messrs. Quinn and Shoobridge had evidence of a more convincing character submitted to them—as the suggestion is made by Dr. White that pitted apples should not be eaten, it may be assumed that arsenic was shown by analysis to be present in the degraded matter beneath the pit—before they forwarded the following official report to the Acting Minister and on which he has hung up Mr. McAlpine's proposed work Which reads thus:

> An independent subsidised investigation by Mr McAlpine or anyone else may reasonably be postponed for twelve months, because (a) there is at least prima facie evidence in favor of the theory formulated by Dr. White and Professor Ewart: (b) in view of the vital importance in orchard work of the practice of spraying with poisonous compounds for Codlin moth, it is most advisable that the point now raised for the first time be cleared up without delay, in order that any possible necessary modifications of the practice may be formulated; (c) the theory if true can be readily proved experimentally; (d) if false it can be disproved in a single apple in each State at slight expense; (e) supposed predisposing factors in the causation of the disease such as variety of apple, times of spraying, weather conditions, etc., can be investigated in the same season; (f) that ideas which suggest themselves (as the outcome of the theory) as to the means of preventing or minimising the disease can readily be tested at the same time; (g) that Dr. White and Professor Ewart having already been carrying out their research on scientific lines for nine months or more, in the course of which they have discovered what appears to be the precise nature of the disease, may reasonably be afforded the opportunity of proving the correctness or otherwise of their theory; (h) that if the theory is announced at this juncture an opportunity will be afforded growers in the northern hemisphere of testing the theory straightway and thus possibly it may be established or disproved before the next Australian apple season.

They also suggest that Drs. White and Ewart continue their work—next season—on Federal account. This is as it should be and is a course which will meet with the approval of every orchardist, for no possible means, however disputed, of getting at the truth should want for the fullest support. But why next season? If poison will penetrate the half-developed apple it ought surely to do so at a later stage and there are thousands of bushels still unpicked. In any case experiment now should at least be some guide as to possibilities and might be expected to further justify or discredit Dr. Tudor's action.

What orchardists will very justly complain of is that on the insufficient evidence made public, the long delayed Federal-State investigation, by the acknowledged leader in plant pathology in the Commonwealth, should be postponed for the sake of proving or disproving the soundness of a theory which at best can be of but secondary importance, viz., whether under certain conditions at present unknown, the application of Arsenate of Lead acts as an exciting or contributing cause in the Bitter Pit disease, which is the utmost that the present investigators can, or indeed, apparently, wish to claim for their discovery. Assuming the presence of arsenic in the fruit and in view of the whole of the circumstances of the case, one might well ask, Is it any more reasonable to conclude that the pit is there because of the arsenic, than to say that the arsenic penetrated the fruit because of a "fault" in the skin of the fruit occasioned by some action of sap maturation and flow, following on the artificial treatment of trees in the application of manures and in pruning, which "fault" would in any case have been followed by pitting?

The increase of pit since the use of arsenate of lead, quoted by supporters of the theory, supposing such increase to be a fact, is probably simply a result of the great increase in the number of trees of bearing age and of the greater extent to which heavy manuring, hard pruning, and deep cultivation is now practiced.

To sum up. Orchardists want to get to the root of the matter, and in the opinion of many of the foremost fruitgrowers of Australia, that is to be found at the root of the tree and it is indeed deplorable that so promising an arrangement as that agreed to between the Commonwealth and State Governments should be allowed to lapse and it is to be hoped that the "emphatic" protest in which the Victorian Minister of Agriculture has voiced the unanimous wish of fruitgrowers, will bear speedy results. At present the verdict of the fruitgrowing world as to arsenate of lead is, "Not guilty, my Lord."

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The Iris and Its Culture.

The iris, or as sometimes known the fleur de lis, rainbow flower, or poor man's orchid, etc., has more than 170 described pure species, somewhat more than 130 species are grown by English iris fanciers among which, however, a portion fail to combine sufficient distinction, beauty, or ease of culture to warrant their extended use.

The question of the best species, their peculiar requirements, if any, their ornamental and color effect, their better varieties and season of bloom are matters of interest, because there is much of neglected beauty in the class from lack of this knowledge and danger of disdisappointment from a misunderstanding of the limitations in color range. It is possible, too, to very materially extend the period of bloom as compared with the usual results attained.

Such irises as figure in horticultural uses are divided into two classes, those of bulbous nature and those with rhizomes, the latter varying in this character from the conspicuous surface rhizomes of the very familiar German iris to very narrow, inconspicuous, subterraneous types of rhizomes in which the roots are the more conspicuous.

The bulbous irises are most familiarly known by the English and Spanish types, both of which have been very greatly improved by selection. The English iris (Iris xiphioides), growing to a height of a foot and a half to two feet, bears two to three flowers to a stalk and varies in color from the purest white form through shades of lavender, blue, and purple. Many, too, are showily striped, flaked and blotched with shades of richer colors than the general tone of the flowers. The Spanish iris (Iris Ziphium) has taller and more conspicuous standards than the last and the markings are more clearly defined on the falls than is the case with the English iris; possibly the improvement by selection has covered a longer period with the Spanish iris. The flowers are richly colored in bronze, yellow, orange, blue, and white, with beautiful markings.

Both English and Spanish iris are of easy garden culture, the English iris requiring the greater moisture of the two, the bulbs being planted at g depth of from three to five inches while a mulch is an advantage.

The dwarf bulbous species are most familiarly represented by the

Iris reticulata, a native of Palestine, varying somewhat in type but gorgeous in coloring with its brilliant shadings of purple and gold, and of a delicious violet fragrance. These, with the Peacock Iris, another dwarf, are very useful for rockeries, bordering, or they may be used very advantageously in masses.

Of rhizomatous irises the most important classes is that of the Onocyclus group, generally known as Cushion irises. The most familiar species is the Mourning iris or Iris susiana. All have very broad petals, and among them are the most remarkable forms in coloring. Many of the flowers are most delicately veined and reticulated, generally with a darker color on a light background. They are from Persia, Armenia, and Afghanistan and naturally require hard sun baking after their short blooming season. The wonderfully full flowers with their peculiar markings make them particularly interesting and tantalizing, for they are the least easy of all the irises to grow.

The surface rhizomed forms gre more popularly known as German though the true Iris Germanica is but one of many species, including dwarf forms, possessing great merit in their range of bloom and the earliness of flowering period. The gem among dwarf irises, however, is the crested Iris cristata, only growing about six inches high with light green foliage. It forms a carpet of verdure and bears freely light blue flowers blotched with golden yellow.

For perfect hardihood, freedom of bloom, and range of color we can, however, with the dwarf and taller growing German irises feel quite independent of the more difficult forms. The German iris, as popularly known, varies in growth in the varied forms from fifteen to forty inches, and by a careful selection of kinds it is possible to keep up a succession of flowers for several months.

The crowning beauty of all German irises is traceable to the blood of Iris pallida, the broadest leaved of all, with sword-like foliage often attaining a height of two and one-half feet and an inch and a half across the blade. The flowers are borne on long stems well above the foliage, altogether producing a most charming effect. The variety Dalmatica sometimes known as Princess Beatrice, is the finest, with immense flowers of a rich lavender blue and with a charming though subtle fragrance. Delicata is of weaker growth, with falls lavender, shading to white and French-gray standards.

All of these irises with surface rhizomes are of the easiest cultivation, thriving in ordinary garden soils, requiring subdivision and replanting in re-enriched soils as their clumps become large or the soil becomes exhausted. This replanting should be done as soon as the foliage shows signs of ripening. In planting it is better not to sink the rhizomes over an inch below the surface unless the situation is naturally a very dry one. As the plants become established the rhizome soon assumes its proper elevation.

The Jacob's Sword (Iris Pseudacorus) occupies an intermediate position. It is a beautiful plant to associate with water and yet will thrive admirably in ordinary garden soils; with ample dark-green foliage it makes a vigorous and healthy clump and bears abundantly of rich golden yellow flowers with a conspicuous orange zone on the base of the falls. Two types are common, one with narrower petals than the other. The Gladwin, or Roast-Beef plant (Iris foetidissima), while pale blue in its variety citrina is of a clear yellow, but the main interest in this centres in the ornamental effect of the bursting seed pods within which the fleshy bright orange colored seeds show to advantage.

Those irises with so-called tufted roots are represented familiarly by the Siberian and Japanese classes. The Siberian has a number of distinct forms of which the type is a tall leafy plant four to five feet high with many flowering stems bearing from three to five flowers to a stem, and with dark blue coloring marked with white pencillings. The two most useful forms, however, are the pure white variety which grows about two feet high, bearing purest white flowers in small clusters, an admirable plant for any flower bed, and the variety orientalis, with broader, shorter foliage growing to a height of eighteen inches and bearing with wonderful profusion flowers of the richest blue with faint throat markings. There is no better true blue in the iris family than this. It, too, is one of the few irises which will bloom a second time, though sparingly it is true, by cutting down after the flowering period. This can hardly be recommended, however, No iris reproduces itself any faster than this. It quickly forms broad colonies and necessarily requires division and transplanting.

Japanese irises comprise, perhaps, the best of the family; they are much misunderstood and require more judgment in their cultivation than do German irises. But it is, however, quite a false impression that the Japanese plant them where they are subject to excesses of moisture in winter. During this period the Japanese iris fields are drained. All Japanese irises are seemingly improved and selected varieties, rather than hybrids. Their range of color is a very ample one, from white to a purple-black.

— Discussion. —

The English and Japanese (Kempferi) prefer a slightly shaded position and thrive best in more moist positions than the others which revel in full sunshine.

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Pruning.

The following paper read before the Wisconsin State Horticultural Society sets out so clearly the principles governing the practice of pruning that its careful study will be helpful to anyone interested in fruit growing:—

Pruning is the removal of a part of a plant, in order that the remainder may better serve our purpose.—Goff in Principles of Plant Culture.

It is the office of the gardener to assist nature. In every neglected tree top may be found evidence of pruning, rudimentary branches that have failed to develop for lack of air and sunlight; branches broken by wind or affected by disease and removed by the processes of decay. This is natural pruning. The skilled gardener anticipates these contingencies by careful and regular pruning.

In order to prune intelligently it is necessary to be acquainted with the principles of plant growth. A brief outline of some of these follow:

— How Plants Feed. —

The food of plants is derived in part from the soil. This crude (undigested) material is taken up by the roots and conveyed through the outer wood layers to the leaves, where by action of the sunlight it is changed (digested) and distributed to bud, branch and root to be used in growth or stored as reserve.

It follows from this that the removal of any large part of the leaves, — pruning in summer, — deprives the plant of its power to assimilate food, — checks wood growth. In like manner the removal of roots, at any season, checks wood growth by depriving the plant of the power to appropriate food.

— Balance Between Root and Branch. —

Under normal — undisturbed — conditions a balance exists in a tree or plant between roots and top, i.e., a certain number of roots for a certain number of buds and branches.

The removal of one without disturbing the other upsets the balance. If one-fourth of the branches of a tree are removed during the dormant period when feeding time, spring, comes again the roots send up food for all. The result is greatly increased wood growth, the revival of dormant buds and in some cases growth of sap-sprouts. Conversely root-pruning without a corresponding removal of branches causes a check to wood growth.

— Length of Growing Season. —

Orchard trees in general grow, in length of shoots, but little after midsummer. Growth during the remainder of the season is in the direction of wood maturity, the ripening of fruit, and the development of fruit buds for the following season.

From these facts the conclusion may be drawn that pruning during the dormant season induces wood growth and pruning in summer, i.e., pinching shoots early in summer to check wood growth, or removing branches later in summer induces fruit bearing.

— Checking Growth Induces Fruit Bearing. —

Any practice which serves to check growth, if it does not interfere with the health of the plants, will induce fruit-bearing. While this principle may not be as readily demonstrated as the others, it is yet a matter of common observation.

— Buds. —

Two kinds of buds may be observed on orchard trees during the leafless season, leaf-buds and flower or fruit-buds. These may usually be distinguished by a difference in size and position, the leaf-buds, those which in spring will produce only leaves, being smaller than the fruit-buds and lying closer to the branch.

In the apple and pear the fruit buds are borne on spurs, i.e., short and thickened branches.

— How Wounds Heal. —

The stems of fruit trees consist of, (a) the bark, (b) the cambium layer or sap carrier, (c) a layer of softer sap-wood, and (d) a central cylinder or heart-wood. The heart wood never heals. When a branch is properly cut in pruning the wound is covered with a cushion or layer of woody material called callus. This callus is composed of food material prepared in the leaves above or beyond the cut.

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It follows then that no callus can be formed and no healing take place unless there are leaves beyond the cut to prepare food. Stubs therefore never heal.

— In Pruning Cut Close to the Trunk and Parallel with it. —

At the base of every branch will be found a bulge or swelling. In pruning the cut should be made so as to remove this or a stub will result.

— Dressing for Wounds. —

As the heart wood never heals and remains always moist it is essential to cover all large wounds as soon as made with some material which will prevent the entrance of germs which cause disease and decay until the callus cushion or healing tissue covers the wound. For this purpose grafting-wax is a most excellent material. If this is not available lead and oil paint affords an excellent substitute. Wounds under one inch in diameter will usually heal in one season without treatment; all larger than this should have a thorough dressing of wax or paint.

— Specific Directions. —

It is difficult to give definite directions for pruning and still more difficult to follow such directions, as every tree and plant possess a certain individuality which must be considered in pruning.

The orchardist's beginning in pruning comes when the trees are planted.

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Before the tree was removed from the nursery row it had sufficient roots to supply all of its buds with water. When the tree was dug most of the roots were removed without a corresponding reduction of the buds, thus disturbing the normal balance. As soon as warm weather comes after planting every healthy bud will push out and call for water to feed its new-born leaves. As many of the roots which formerly supplied these buds have been torn away by the tree digger and the remainder have not yet begun work the reserve supply of food and water stored in trunk and branch the previous season must be used; if this is exhausted before new roots can be developed the tree will perish.

We must then reduce these water pumps or buds to correspond to the reduced root-system. The drier the ground and the weather the more we should cut off.

— The Formative Period. —

Pruning at planting time involves more than the shortening of branches. Whether the future tree shall be high headed or low headed, open center or with a central axis depends in a large measure on the pruning the first season. Trees headed 18 to 24 inches from the ground are to be preferred.

Nursery grown trees are often headed higher than this, but nurserymen, like other producers, are willing and anxious to provide what the market demands.

In pruning the newly-set tree it must not be forgotten that the framework on which the branch system is built is determined at this time. Aim to leave the main branches, the "scaffold" limbs, spirally about the stem rather than opposite. Having lower opposite branches in fruit trees is a had form that may split down later and ruin the tree.

Pruning the second and succeeding years will consist mainly in removing crossing and interfering branches and correcting as far as possible the faults of the tree that it may approach the ideal of the grower. In from two to five years from planting, according to the species, the tree will have assumed the bearing habit and less pruning trees will usually bear a surplus of ever, to entirely neglect the tree in respect to pruning. Regular, annual pruning insures stability, while if pruning is neglected for three or four years followed by heavy pruning the balance of root and top growth is disturbed, resulting in an increased wood growth at the expense of fruit.

— Renovating Neglected Trees. —

In pruning such trees the main effort must be directed to thinning the branches. The tops of neglected fruit tsees will usually bear a surplus of branches as well as stubs and broken branches. The removal of these will be followed by a heavy growth of wood, a portion of which must be removed the following year, but if to pruning is added tillage and enrichment of the soil the tree will soon settle down to fruit bearing.

— Season for Pruning. —

"The conclusion, — and my general opinion, — in respect to season of pruning, so far as the healing of wounds is concerned, is this: The ideal time is in the spring, before growth begins . . . but more depends on the position of the wound in the tree and the length of stub than on the time of year."—L. H. Bailey in the Pruning Book.

— Summer Pruning. —

Theoretically we may check wood growth and induce formation of flower buds in fruit trees by pinching or cutting back the more vigorous shoots during the growing season, but in practice it is rarely that these objects are attained. If the tips of the branches are removed too early in the season the buds immediately back of the cut will push out into secondary branches, resulting in an increased rather than a lessened production of wood. If pinching is delayed until the active growth has ceased for the season no check to growth will result.

"The greatest success will attend this process if the pinching takes place just at the period when the buds have still sufficient time to swell up and become stored with food material, but when the supply of water begins to diminish, so that the upper buds do not grow out into long latterals."

"To prevent disappointment, we state emphatically, as the practice is very common, that no fixed rule can be laid down for the commencement of summer pruning. Trees may even be pinched to death. The favorable time for this operation depends upon the climate, the soil, the variety, and even upon the individual characteristics of the plant. The cultivator must himself judge whether the shoots have reached such a stage of maturity that an elongation of the uppermost buds will not take place."—Sorauerer in The Physiology of Plants.

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Pruning after midsummer, when active growth has ceased, approaches in its effect on the tree, pruning during the winter and early spring.

* * *

Washing Soda for Scale.

A correspondent writes :—"You will perhaps remember that you recommended me to try washing soda as a simple and easily applied cure for scale on two or three lemon trees of mine which were badly affected. I noticed a paragraph in my daily paper the other morning which stated that this remedy had been tested without result. All I can say is that it cleared my trees which are now clean and healthy, and I consider it an excellent idea." Our friend should remember that it is unwise to assume a general conclusion from an isolated individual case in which quite possibly unknown indirect causes operated to bring about the results which are attributed, as in this case, to secondary or quite unimportant factors. We noticed the washing soda idea in, we believe, an American exchange and passed it on, for trial by owners of a few trees who like our correspondent had neither the interest or means to use one of the recognised sprays or to fumigate. The matter is now being tested by the New South Wales Department of Agriculture and we believe in Victoria. Hitherto the results have been reported as negative. No doubt a final reuort will be made in due course.

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Bees and Fruit Production.

In a recent report the Trade Commissioner in London remarks—"As I know a good deal has been said in South Australia in regard to the importance of all fruitgrowers also cultivating the bee industry, I would like to point out for the benefit of fruitgrowers in South Australia that considerable experiments were carried out in England last year in this regard, with the result that it is now considered that bees are absolutely essential to the safe setting of fruit. One of the experiments adopted was to cover over several gooseberry bushes with a fine net when they were in flower, thus preventing the bees from approaching them. While other bushes in the same garden that were not so covered had a good crop of fruit, the fruit on the bushes which were protected from the bees, with very few exceptions, came off."

The experiments to which Mr. Norton refers are fully reported in a late issue of the Journal of the (British) Board of Agriculture and are of considerable interest to fruit growers. We make the following extracts from the article in question "Action of Bees in Pollination" by W. B. Little, Instructor of Horticulture. The writer considers that the experiments conclusively show that hive bees are necessary to ensure the distribution of pollen, and further that these tests confirm the American tests conducted during the previous year. Mr. Little goes on to say that "the trees experimented upon were apples, black and red currants and gooseberries. The method adopted in the case of the currants and gooseberries was to select an averaged sized bush before the flowers had expanded, and to place around it four posts driven into the ground. To these posts wire netting was attached enveloping the bush, and this was then covered with white muslin, to prevent the entrance of all large insects. This remained over the bush for about three weeks. After the netting was taken off it was found that some undeveloped berries still adhered to the branches, but these soon afterwards dropped off, and eventually there was not a berry left on the bush." The writer then states that this bush was afterwards denuded of its leaves by an attack of sawfly caterpillars and the tips of the shoots were injured by aphis, but whether any special liability to attack was supposed to have been induced by the covering is not stated and in any case any secondary results would not be material to the purpose of the experiment. This question is, however, referred to in another paragraph. Continuing his report the author states that "the remainder of the gooseberry bushes grown in adjoining rows to which bees had free access carried an abundance of fruit, and were generally healthy."

"Plants of two varieties of currant were protected from the visits of insects in the same way. No fruit developed on these bushes, and as a result they made excessive growth, both as regards foliage and shoots. The remainder of the red and white currants which were unprotected were laden with fruit."

"In the experiment with apple trees, varieties were chosen which were likely to carry a good crop, and one branch was covered with muslin before the flowers opened, the others being left exposed. In each case the covered branch bore no fruit, while the remainder of the branches carried a good crop."

"It was anticipated that some persons might be inclined to attribute the non-setting or non-development of fruit to the exclusion of sun and air by covering with muslin. It was, therefore, decided to cover a branch after the flowers had been open for a few days, and had thus had an opportunity of being pollinated. Before the petals had fallen one branch of an apple tree was covered with muslin in this way; the muslin was not interfered with until it was removed. It was then found that six well-developed apples were borne by the branch. This result seems to prove that the exclusion of a certain amount of sunshine and air by the muslin in no way affects the non-setting of the fruit."

In a second experiment the results were in accordance with those recorded above.

In a third test the results were even more decisive in favour of bees as agents for pollen distribution and the details are specially instructive. The writer states that—"It was noticed that the trees and bushes on this plot very rarely carried satisfactory crops of fruit, and it was thought that this might be attributed to an insufficient supply of bees. The nearest hives were about half a mile to the east, and as the prevailing winds were from the west it seemed likely that the bees when leaving their hives would fly east for shelter. An expert apiarist assisted in the experiment, and placed in the orchard two hives of Italian bees, this variety being chosen to enable them to be distinguished from local bees when at work amongst the flowers. During the flowering period of the early varieties, the weather was unfavourable, but during occasional gleams of sunshine the bees were very busy. The later varieties were favoured with better weather. They were kept under observation and found that the percentage of bees other than Italian which visited the trees was very small, and on some occasions hundreds of these bees were at work when not another variety of insect could be seen."

"Bushes of red and black currants and gooseberry, and branches of apples, pears and plums (one of each), were covered with muslin. On some of the bushes a few odd fruits developed, while on the branches of the large fruits not a specimen matured. The crops carried by the remainder of the trees and bushes were excellent, and there was not a single variety of either apples, pears or plums which did not bear fruit. It is inferred from this that the bees which previously visited the plot were insufficient in numbers."

"Other insects besides bees may possibly play a part in the distribution of pollen, but it may be observed that comparatively few are on the wing at the time of the flowering of fruit trees. The whole of the colonies of wild bees, with the exception of the females, die off during winter months while the females lie dormant until spring. The honey bees on the other hand, retain their full strength, and being well protected in the hives from inclement weather, they are ready on the first gleam of sunshine to sally forth in quest of honey, and in this way they distribute pollen."

"In favourable seasons the wind undoubtedly is responsible for the distribution of a large quantity of pollen, but when wet weather is experienced in the spring it is possible that the pollen is not dry enough for the agency of the wind to be effective.

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The Value of Humus.

It is generally understood, by now, that the term humus means to the agriculturist the dark-coloured material, formed of plant remains, that gives the soil its characteristic different colour from that of the subsoil. The researches of recent years have shown that this material is formed, from vegetable waste, by the action of bacteria in a partial or total absence of air. The circumstances under which it is produced cause more of it to be found in land that has not been tilled for some time than in that which has been turned over regularly; this condition is met with more frequently in temperate climates than in the tropics. It is a matter of common observation, that the humus content of clay soils is higher than that of sandy soils, because the access of air to the interior of the soil is not as great in the case of the former as in the latter, so that almost ideal conditions for the production of humus are afforded by clay soils.

In dealing with humus more generally, it will be well to treat, in turn, of its importance, firstly in relation to the soil, and secondly with reference to the plant. It must not be forgotten, however, that all final effects of humus have a direct or indirect influence on the plant; for whatever affects the soil must ultimately have its influence on the vegetation which it supports.

One of the most useful effects, to the agriculturist, of the possession by a soil of a good humus content is the circumstance that this improves its texture, so that there is ease as well as economy in tillage operations. The artificial employment of this fact has its largest application on heavy clay soils, in the improvement of their condition by the use of vegetable matter either in form of decayed remains such as trash, or as withered green dressings. Another matter, to which reference may be made, is the effect of humus in darkening the colour of soils and thus increasing their ability to absorb heat.

It is recognized by the agriculturist that all soils contain mineral plant food in an unavailable condition. He knows, too, that some of this may be freed in a state in which it can be used by plants, by the employment of artificial dressings such as lime. Humus probably plays the greatest part, however, in this matter, both artificially and in nature. This is because of its power to form bodies, commonly called humic acids, which have a dissolving action on some of the mineral constituents of the soil. The process is naturally slow but is continuous and, where the soil is well supplied with humus, its eventual importance in relation to the provision of mineral plant food is obvious, especially when consideration is given to the comparatively small bulk of this food that is necessary to plants.

A final general matter in connection with humus in a soil is probably of the greatest concern as regards its ultimate effect in enabling that soil to produce quantities of vegetation. This is the circumstance that it provides ideal surroundings to, and a certain amount of food for, the bacteria which effect improvements in the soil, from the agriculturist's point of view. This appears particularly to be the case in relation to the nitrogen-fixing organisms. Greater recognition of the importance of the extent to which these affect the nitrogen content of the soil is being attained rapidly, and the matter is brought particularly to the notice of agriculturists on account of the comparative difficulty and expense of sustaining an adequate nitrogen content in the land from which they raise their crops.

The next matter to consider is the value of humus in relation to the plant, more directly. In the first place, humus itself contains nitrogen, potash and phosphates, and this is a fact that becomes of importance when the suggestion is made to remove plant waste from the land, or on the other hand, to bring in supplies of vegetable material from other areas on which it has been raised. The matter will be considered further, in the former aspect, when the question is raised of the destruction of vegetable matter for the control of pests.

The most important and most fully recognized direct function of humus in relation to the plant is the effect that it possesses in increasing the capacity of soils to absorb water, as well as their ability to hold it when it is supplied to them. It has been considered already that the power of a plant to grow depends upon the existence of several limiting factors, the absence of, or deficiency in, any one of which will interfere with its proper development. Of these factors, as is well known, the one whose absence or insufficiency most quickly shows itself is the water-supply, and the importance of humus in keeping this at an adequate level cannot be underestimated.

The consideration may now be undertaken of some of the more particularized facts in relation to humus. One that has been indicated already is the quick rate at which vegetable matter is lost from sandy soils. This is on account of the easy access of air to such soils, whereby the bacterial action which would lead to the formation of humus is prevented, and oxidation takes place; so that the material is quickly lost in the atmosphere. It is in such soils that the agriculturist requires to exercise the greatest care in regard to the supply of humus, especially as if this is deficient, because any water that they receive passes away almost immediately, through drainage.

Other matters that remain for short consideration in the present relation are those dealing with what is called 'soluble humus,' and the connection between carbohydrates in the soil and the increase of efficiency of the nitrogen-fixing organisms. Soluble humus, it may be explained, is the product obtained by the action of alkalis such asammonia and soda on the humic acids; there is a large amount of this matter dissolved in the dark liquid that drains away from manure heaps, because of the alkalinity of the contents of such heaks, through the production of ammonia. Much remains to be discovered concerning soluble humus, and it is not yet known with certainity if similar bodies are of direct use to green plants.—"The Agricultural News."

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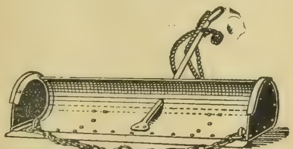

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Not the least of the many pests with which the orchardist, and more particularly the grower of peaches, has to contend is aphis. Fortunately control and, in fact, entire prevention is not impossible. Of the many remedies which have been tried the Red Oil Spray has come very prominently to the front and is by many considered the most effectual method of prevention. In using this material it is essential to remember two things. First, that the treatment must be applied early, and, secondly, that the Oil must be thoroughly emulsified. Last year some instructive experiments were conducted by one of the officers of the Victorian Agricultural service, the results being summarized in a lecture delivered before a meeting of fruit growers. Inspector Wallis, after detailing the life history of the aphis, emphasised the importance of the winter treatment and the necessity for doing the work thoroughly. The lecturer contended that there was no evidence to show that the aphis lived on the roots, at all events to any extent, and he considered that any form of root treatment was unnecessary if Red Oil Spray (which had given the best results in his experiments) were used early. With regards to occasional damage to trees said to be due to this Spray, Inspector Wallis stated that his belief was, that in 99 cases out of 100 the damage was caused by improper mixing, and added "When making the emulsion it is necessary to see that every particle of soap is dissolved. The only way to emulsify mineral oils is to use rain water and proceed as follows:—To a gallon of Oil take not more than a gallon of water, and 1 lb. of commercial soft soap. Dissolve the soap thoroughly in hot water. Next heat the mixture to boiling point, place the Oil in it, and agitate it until the ingredients are thoroughly incorporated. It is quite safe to use cold water, provided proper water and soap is used, and the materials otherwise properly mixed. A great saving of time is effected in this way, but special care must be taken to see that the concentrated mixture is thoroughly emulsified before the extra water is added."

Catalogues Received.

We have received copies of their annual catalogues from Messrs. E. and W. Hackett, Messrs. Law Somner & Co., Mr. W. J. Smith, and Mr. Lasscock of the Lockleys Nursery. Copies of either may be obtained on application.

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ONE of Queensland's best-known churchmen, the Rev. J. Williams, for eleven years pastor of the Woolongabba Congregational Church, Brisbane, and Principal of the Theological School established there, writes:—

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(Signed) J. WILLIAMS."

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2 bottles London Worcester. Sauce, pint size	0	0	3
1 lb. Lollies, 1d.; 1 lb. Starch, 1d.; ½ lb. Blue, 1d.; 1 lb. Coffee, 8d.	0	0	11
1 lb. Baking Powder, 3d.; 1 lb. Candles, 3d.; 1 bottle Essence Lemon, 1d. ...	0	0	7
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A £1 parcel may be arranged by taking half quantities of the larger items, others will be added to make up the amount. Customers desiring may have goods of equal value not mentioned in this list substituted in place of any of the smaller lines not wished for. When goods are intended for prepaid rail sidings or ports, it will prevent delay if cost of carriage or freight is added.

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Vegetable Garden.

Vegetable Notes for June.

The great secret in all good gardening is in keeping the surface always open. Deep and thorough tillage is important, the free use of manure is a wonderful help, good seed is necessary, but the hoe is the implement that cannot be dispensed with.

Sow brocoli, cabbage, etc., and also plant any of the tribe. These plants want lots of manure, lots of moisture, and hoeing.

Carrots of the early sorts can be sown. Make the bed very fine.

Spinach is a vegetable that ought to be largely used, and a short row should be sown about once a week for the next few weeks. The soil must be rich, light, and moist.

Celery should be bleached, commencing a month before it is wanted. Take the leaf stems in the hand, wrap brown paper around, and then earth up. This plan is best where time is not too valuable. The stems should be dry before being closed up, and any slugs or snails removed. Plant out young stuff as it comes along.

Onions may be thinned and transplanted.

Turnips may be sown ; sandy soil with a little clay is best.

Sow beets, celery, carrots, parsnips, salsafy, scorzonera, parsley, lettuce, radish, and all other salads, herbs, asparagus, and rhubarb.

Plant potatoes. Plant on the flat, not in ridges. Plant single eyes upon each sett, not a lot of eyes which will weaken the plant.

Jerusalem artichokes may now be planted in rows 4ft. x 2ft.

Plant all sorts of onions, chives, garlic, etc.

Sow broad beans and peas.

Seakale and rhubarb can be forced now by covering each set of roots with a box and then heaping fresh stable litter over each lot. The roots will be so weakened by this that they will be of very little use afterwards.

Early cucumbers and melons can be raised from seeds sown now under frames upon a hot bed. Capsicums, tomatoes, and other tender plants can also be raised upon a hot bed.

For asparagus the soil wants to be rich and deeply and well prepared. Roots or two or three years old are the best to plant. Cover with four inches of soil.

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Interesting to Potato Growers.

Potato growers have long recognised the desirability of an improved mechanical method of lifting their crops. In this connection the following interesting paragraph appears in the May issue of the "Queensland Agricultural Journal" with reference to a potato digger which Mr. J. Mahon, of the Gatton College purchased when in England recently. Mr. Mahon writes : "I have to inform you that the potato digger imported from England by me is known as the Martin Potato Digger. I witnessed this machine at work in England, Scotland, Ireland, Guernsey, Jersey, France, and Germany. In all these places the machine has given thorough satisfaction. I have worked it at the College, and found that it does the work in a most satisfactory manner. I have tested it in both wet and dry soils, with good results in each case. I can strongly recommend the machine. 'Martin and Co., Samford, England,'' is the address of the manufacturers. The draught is light, and two small horses can work the machine in any class of soil."

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The Loofah or Vegetable Sponge.

Most people who use a loofah as a substitute for the marine growth usually called sponge are probably under the impression that it is closely allied in origin and habit to the last named useful article. As a matter of fact this is quite a mistake for the loofah is in reality the dried fruit of a plant of the same order as the melon cucumber squash, etc. Botanically it is known as Luffa argyptiaca. It is indigenous to semi-tropical countries and grows and fruits freely in Natal, East and West Indies, Madagascar, etc. Probably the climate of South Australia is too dry for it to flourish with us but north of Sydney and along the Queensland coast or wherever the sugar cane will grow the loofah should be a profitable minor crop. The Agricultural Journal of the Cape of Good Hope describes the process of its treatment for market as follows :—

"The fruits should be allowed to remain on the vines until they have acquired a yellowish tint, but not until they have begun to assume a brown colour, as this indicates that the outer skin of the gourds is undergoing decay, which will cause the fibrous structure within to become discoloured. The fruits should be cut from the vine with about 2 inches of stem attached, for convenience of hanging. They should be hung in an airy, draughty shed for two or three days, and the outer skin will then be found to be fairly soft and pliant; this stage of the preparation is assisted by cutting off the tip of the gourd at the lower end, leaving a small hole through which the contained moisture may drip. The loofahs may next be removed by running the finger down the skin of the fruit on one side, splitting it open, and turning out the loofah, which is at once thrown into a washing vat containing lime-water (5 lb. of slaked lime to 60 gallons of water). The loofahs are stirred about in the lime-water for a few minutes, and then removed to a draughty shed to dry. Care should be taken to shake the lime-water out of each loofah before drying. If the loofahs are dried too quickly they are apt to become brittle and crack; they must not, however, remain damp too long, or they may become mouldy, though the lime prevents this to a large extent, and is, indeed, used in order to protect them from fungoid growths. When the loofahs are dry, the seeds may be easily shaken out of them by hand, and when this is done they are ready for the masket.

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Weeds are easier to kill when they are small than after they have grown to full size.

Competition—Fair and Foul.

Competition, it is claimed, is the life of trade—and so perhaps it is, providing of course the "live and let live" principle is not lost sight of.

The idea that one man's failure constitutes another man's success or vice versa, as we have been led to believe has long since been relegated, in theory at least, to the rubbish heap of similar fallacies, having no foundation in fact.

The progressive business man of to-day is inclined to take a more rational and a broader view of business conditions and business opportunities. It begins to dawn upon him that the fundamental principle underlying the success of any enterprise, great or small, must first of all be sound in itself, else no enterprise can possibly endure.

"Peace on earth and good will toward men" is a beautiful injunction, having the right ring to it—in Church.

"Business is business" bears a more practical sound to our ears. It is our favorite slogan and, in our estimation, it is broad and powerful enough to cover up a multitude of sins.

Fair competition courts the light of day. Having nothing to fear and nothing to conceal, it stands upon a pedestal of its own creation, firm and

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indestructible, in full view of an exacting multitude being eager to prove and to convince, striving to achieve its success not by the circuitous way of fraud and deception, but by the straighter path of honorable means and honest business methods. Fair Competition believes in the "live and let live" principle. Having learned that lesson in its own school of Experience, it is eager to promulgate its truth to the world at large, fearing no detriment to its own interests, no ill results to its own pocket book. It is like an open book, accessible to all wishing to peruse its pages.

Fair Competition goes into the open market, firmly convinced that merit must and will win in the end, that success, if it is to be permanent, must rest not upon the quicksand of uncertainty, but upon a bed rock of stability.

It makes no rash promises, it shuns reckless statements, it abhors falsifications and adulterations of all sorts, ever aiming to improve rather than to cheapen quality, ever striving to win and to hold public confidence without which success is impossible.

Fair Competition does not cringe, does not fawn and does not sham—such despicable methods being foreign to its business policy. Nor does it concern itself with the affairs of its rivals for the purpose of ascertaining their methods in order to underbid and to undersell them.

If John sees fit to cut prices heralding that fact for months in advance with a view of cornering the market and incidentally to put his rival out of business—it is John's own affair of course. Fair Competition does not attempt to follow his methods, much less to "go him one better," knowing full well that such prices do not cover the cost of production, let alone a living profit—realizing that by attempting to corner the market John will inevitably get into a tight corner himself, and it is seldom indeed that it errs in its judgment.

Fair Competition has mapped out its own way of doing things and it follows its own business methods. It reasons thus: All things being equal—the cost of production plus the cost of marketing the product, plus a legitimate profit—the price to the consumer must be clearly defined and based upon strict business lines, that any deviation from this straight business course, either one way or the other, must inevitably result either in a loss of confidence and custom, if the quality of the product be cheapened, else in financial ruin to the concern itself if quality be maintained at the expense of its legitimate profit.

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Publications Received.

A DAIRY LABORATORY GUIDE.

By H. E. Ross.

New York State College of Agriculture at Cornell University.

The study of dairy industry is an exact science. In the study of any science it is necessary that the student have some guide for his work, otherwise much time is lost in useless labor and many wrong impressions are often obtained. The Dairy Laboratory Guide is designed to help the student to master the principles of milk testing, the lactometer and the acid test, and to understand the composition of milk and the relation of the various constituents of milk to one another. This is accomplished by a series of experiments so arranged as to lead logically from one step to another through the entire subject. The exercises are supplemented by enough explanation to enable the student to do his work intelligently and at the same time get the most good from the experiments performed. While the book was intended primarily for use in the laboratory it should be of value to the practical dairyman. The time has come when the successful dairyman must study his business from a purely scientific point of view, and in this book the scientific principles, upon which the dairy industry is based, are stated clearly and simply and wherever it is possible these princeples are illustrated by practical problems and examples. The book consists of 90 pages, 5 x 7 inches. Cloth, net half a dollar. The publishers are Orange Judd Co., 439 Lafayette St., New York.

FARM DEVELOPMENT.

In this age of books, agriculture in its various branches has been the theme of very many volumes. Amongst these, one of the most recent, Farm Development, an Introductory Book of Agriculture, will take a high place. Written by W. M. Hays, Assistant Secretary of the United States Department of Agriculture, and formerly Professor of Agriculture at the University of Minnesota, it bears throughout the imprint of complete knowledge of the scientific side of the subject and a liberal understanding of the practical problems which confront the land-worker. Primarily, of course, it is an American book but the principles and practices of agriculture are world wide in their application, and we should not find it easy to recommend a more helpful book than the one before us. To summarize the contents and yet do justice to the book would be difficult. Briefly the work includes a discussion of soils, selecting and planning farms, subduing the fields, drainage, irrigation, roads, fences, together with chapters concerning farm business and the Relations of General Science to Agriculture. The book is profusely illustrated, 5½ x 8 inches. 392 pages. Cloth, net, 1½ dollars. Our copy reaches us from Orange Judd Company, 439 Lafayette Street, New York.

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The Farm

Hints for Farm Butter Makers.

Always strain the cream into the churn through a dipper with a perforated tin bottom. In winter add just a sufficient butter colour of a reliable brand to give a nice yellow tint. Do not depend on pouring it in, but count the drops for a small churning, allowing three or four drops to the pound of butter.

No definite temperature for churning can be given, but the necessity for the constant use of a thermometer must be emphasised. Many conditions influence the temperature of the cream for churning, such as the richness of the cream, the quantity in the churn, the feed and the breed of the cow, the length of time the cows have been milking, the temperature of the room, and the speed of the churn. Aim to make conditions favourable to a low churning temperature, as it insures a better butter and a more exhaustive churning.

Start with the churn about one-third full, and regulate the churning temperature so as to have butter within 20 to 30 minutes. That proper temperature can only be ascertained by past experience with similar cream.

Poor cream often breaks, but will not gather. Try churning slowly. If this does not overcome the difficulty, the only remedy is to draw off part of the buttermilk to lessen the liquid.

Very rich cream is likely to paste or thicken in the churn, so that concussion ceases. Add enough water at the same temperature as the cream to dilute it so that it will drop.

When the churning is about completed, add a couple of quarts of water several degrees lower in temperature than the cream was. In the summer it may be quite cold. This floats the butter and allows the buttermilk to run off more freely. When the butter is the size of wheat grains it is sufficiently gathered. Look frequently at the inside of the churn lid, and when but few small specks are seen on it, the churning is usually finished. Watch the buttermilk as it runs through the strainer dipper, and if any butter comes with the first streams, a little more churning is necessary.

When the buttermilk is drawn, rinse the butter with a little water, and strain through cheesecloth into the churn as much water as there was cream. Have the water from 48 deg. to 56 deg., according to the conditions of the butter and the temperature of the room. In hot weather the wash water may be as cold as possible. Revolve the churn rapidly about a dozen times and wash but once. We recommend washing butter twice if it has come very soft or has an objectionable flavour, or is going to be packed for winter use.

Salt according to the demand of the market. If the butter is for immediate use and is salted on the worker, ¾oz. per pound of butter is usually sufficient. If salting in the churn use an ounce, as not so much is incorporated in the butter. We strongly recommending salting in the churn, as by so doing butter free from streaks can be had with the least possible amount of working, but the churn must be without dashers, and the butter in firm granular form. The only difficulty in this method is gauging the amount of salt. Estimate the weight of butter from the last churning, then weigh the salt. Have the butter evenly spread over the bottom of the churn, sift on part of the salt, tilt the churn forward to cause the butter to lap over, sift on more salt, then tilt the churn backward and put on the remainder of the salt. Put on the lid and revolve the churn very slowly until the butter forms in several lumps. It may be taken out and immediately worked, but if possible it is much better to allow it to stand either in the churn or in a tub, if the churn is in too warm a place, for two or three hours, and then give one working.

If salting on the worker, take the butter from the churn, weigh it, and allow ¾oz. of salt per pound of butter. Spread the butter over the worker, sift the salt on evenly, fold the salt under and begin working.

For the farm dairy there is nothing nicer than the V-shaped lever butter worker. It is not expensive and is a great saver of time and strength, besides preserving the grain of the butter.

Work by means of pressure only; avoid a sliding motion as it makes a greasy butter. Work sufficiently to expel the moisture and thoroughly distribute the salt. Any portion of the butter not reached by the salt will be light in colour.

If the butter is very soft or very hard, work out slightly, allow it to stand, and when at the proper firmness give it a second working.

Keep the butter in a cool clean place and get it to the consumer as soon as possible.

Clean all tin dairy utensils by first rinsing in warm water, then clean inside and out with a brush and hot water in which a cleansing material such as washing soda is dissolved. Lastly, rinse with plenty of boiling water and leave inverted in pure air and sunshine, when available, until wanted for use. —W.L.R., Prairie Farmer.

◆

To keep the flow of milk always milk clean.

The lover of the soil creates real wealth, while in other callings fortunes are made and lost in speculation.

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Farm Notes.

In preparing land for fodder crops of any kind you cannot cultivate too deeply, provided the subsoil is left below, and in a well pulverised state; and you cannot manure too heavily with farmyard manure, provided it is thoroughly mixed with the soil. Fodder crops may grow without manure; they may thrive with a moderate amount; but with good tillage and abundance of manure they will luxuriate.

Sow peas. Field peas generally hold in the pod best, but garden peas will perhaps pay best. Of course a lot of peas will be left upon the field, but sheep and pigs will gather up every seed afterwards. The haulms are good for cows, and other stock will eat them with advantage to their good condition. Two bushels per acre is ample, in drills a foot apart. Mow the crop about six weeks after the first flowers appear, when the lower pods are ripe.

Try a small sowing of flax during this month. For seed, sow three-quarters of a bushel, or less upon very rich light soils. For fibre, sow a bushel and a half. The land must be harrowed down very fine.

Mangolds should be taken up by the end of this month, and be stored in clamps. This develops the sugar, or rather the moisture evaporates, and the percentage of saccharine is greater. The clamp is simply a trench cut in the ground, the bottom and sides lined with straw, the mangolds or other root or fodder put in, covered with straw, and then the earth is heaped upon the whole.

Turn sheep in upon crops growing too rankly, or roll the ground during fine weather, then run a light harrow over. Make drains and water furrows where necessary

In sowing barley or oats see that the soil is mellow. It will pay better to wait a month than to sow upon a bed that will clog or stick to the harrows.

Rape can be sown at any time from March till end of September, and will pay every time if there are sheep or cattle to eat it.

Tares (proper name, "vetches") may be sown with advantage. They give a good yield, and ought to pay for seed, but many tons are used for sowing amongst hay crops.

Every one ought to make a plan of his farm. It is good farming never to raise two crops following of the same nature; and, as far as possible, keep the ground always producing some kind of crop.

Vines and fruit trees, of course, must always remain whence once planted; but by supplying potash and superphosphate, with a good mulch of farm manure, to the trees their vigour will be maintained for years.

Vines will probably grow anywhere in South Australia—certainly on any land where other plants will grow. Vines are about the best paying and most certain croppers that we know of. This next month is the time to plant vines.

Forest trees ought to be planted this month. They should be planted in clumps, and have a fence around to protect them against damage by stock. Timber is worth money now and will be worth more in a few years, and those who plant now will make a good investment.

Wattle seed should be sown in drills six feet apart, with one foot between each plant. Soak the seed until it begins to swell. The seeds need not be covered more than half an inch.

Sow seeds of many kinds of vegetables. Every owner of land ought at least to grow enough vegetables for himself and family.

In sheltered hilly districts the walnut ought to be largely cultivated. The nuts pay almost better than the fruit from any other tree, and ultimately the timber is of very great value. For timber purposes the trees should be planted eight or ten feet apart. If for fruit only, 25 feet is none too much.

No time should be lost in preparing land for the growth of mangolds, beets, carrots, parsnips, cabbages, thousand-headed kale, peas, beans, lupins, lentils, etc.

Lupins are chiefly grown as a green manure for sandy soils, to be ploughed under when in flower. The seeds can be used, crushed and mixed with other food, for live stock.

Plant out all sorts of cabbage for stock-feeding. Perhaps the Drumhead, the Cow-cabbage, and the Thousand-headed are best for the purpose. Rape is also an excellent member of the same family, and its value should be recognised by every farmer.

Every successful farmer has plenty of shelter for his stock, tools, and implements. Any dead stock exposed to rain and heat and cold will rapidly deteriorate, and this means loss of hard cash. Any animal exposed to suffering through exposure to heat, cold, or wet will loose condition and health —more or less—and this means waste of food that has been consumed. The food has been produced upon land that cost hard to produce or rent, and therefore there is loss all through, and it does not pay to neglect the provision of ample shelters for stock, implements, and everything that can be hurt by exposure.

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By economical feeding is meant feeding to the best advantage. It does not necessarily mean feeding at least cost.

A goose with an "authenticated age of fifty-two years," has been killed in Cornwall by a kick from a horse.

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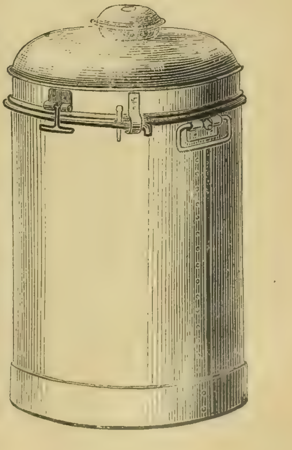

The Brindled Cow.

The following article, written by "Spero" in The Live Stock Journal, may prove of interest to some of our readers:

As an old breeder of pedigree stock, and one who has always steadily advocated the cultivation of purity of blood for all the animals of the farm, if apparent consistency of view were my first object I should hesitate before touching on a subject which seems at first sight to cut against my own arguments. Experience, however, if not wisdom, comes with advancing years, and as a looker-on at the efforts of others one is able to take a dispassionate view of those matters which once appeared to have but one side. Reckless cross-breeding appeals to me as little as ever, and as a general rule I still regard the taking up of a pure breed and sticking to it as the safest policy to adopt. There are, however, so many varying circumstances under which a farmer may be placed, that all cannot be pedigree breeders, even if such a thing were desirable. Recognising as we must do, the great value of the first cross in many instances, we by no means give away the principle of pure breeding so long as we set our faces resolutely against mongrelism, which is quite a different thing, as also is the building up of a new distinct breed by years of patient work and intelligent selection. That is a task which few can undertake, and the weak point in first-crossing is found in the difficulty of keeping up the supply of half-breeds properly so called, without beginning again. But all these things are well known to most people, and I may say at once that these remarks are not being made for the consideration of "breeders," but for a certain large class of dairy-farmers to which the very word "pedigree" is almost obnoxious.

The class to which I refer seldom or never breed at all, but buy in its cows either just before or just after calving. Now arises the question, "What sort of cows do these men usually buy?" We may safely reply, "Common-bred or even mongrels, whose title of Shorthorn is a libel on a noble breed." If they do chance to purchase a really good cow of Shorthorn character, she costs at least £22, and often after five months' milking she will dry off, but having been liberally fed all the time, she will be fat and sell at about £14 or perhaps a little more. These dairy-farmers, being largely town-bred, have no technical knowledge of cattle, and I often study them as they are making their purchases and reflect on how much better they might spend their money. They seem to have a rooted idea that they must have beef as well as milk, and often get much more of the former than the latter, which is the very life-blood of their business. It would be all well enough if they could get a real milking Shorthorn, but market business is a lottery, there being no knowledge of the cow's antecedents. Many times I have seen fleshy cows with thick chines, rounded hips, heavy fore-quarters, and an ugly udder, sold at good prices to small dairy-farmers living near town, while animals exactly suited to their purpose have been standing near without their price being asked. One day it may be a beautiful Welsh cow carrying a splendid vessel standing thus unnoticed; another time a very good Channel Islander, not a Show beauty perhaps, but looking very business-like. No one seems to think of asking more than £12 or £15 at the outside for these "milking-machines"; while a big "beefer" will easily fetch over £20. Quite recently I was an eye-witness of a far better dairy cow than either of those referred to being passed over, and she was a "brindle," and contemptuously alluded to as such. She was, in fact, a half-bred Jersey-Shorthorn, and this brings us back to our text. If ever there was a valuable first cross, surely we have it here. Of course, the produce of a Shorthorn and Jersey may be almost anything to look at. She may follow either parent, but often possesses the good qualities of both. The cow in question was simply an enlarged Jersey, with all her best milking points, but still she was a "brindle," and therefore of little account. As a dairyman's cow she was worthy any other two cows in the market, and yet could have been bought for less than £15.

I am quite convinced that if the dairy-farmers near London could secure a supply of such animals as this, many of them would double their profits; but it would involve a change of plan from that now generally followed, which is to feed highly and sell to the butcher when dry—perhaps the best way to deal with cows which go dry in twenty to twenty-four weeks. A good half-bred brindle, like the Jersey itself, will milk for ten out of twelve months, and to kill her off would be suicidal. Some educative process seems wanted for this large class of hard-working men, who sadly miss their way in the selection of their cattle.

Weaning Pigs.

Pigs should not be weaned (says The Live Stock Journal) until they are at least eight weeks old, and if the sow is not to have a second litter, or if there is time enough in case she is, it is better to let the pigs suckle until they are ten to twelve weeks old. Farmers often get in a hurry and wean pigs when six weeks old, but unless there is an abundant supply of milk, and especially good care is given, the pigs are likely to get stunted, sometimes so severely that they never recover. The cheapest way to "put gains on" young pigs is through the sow. She has a strong digestion, and can turn coarse

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grains and pasture into easily-digested milk.

Careful experiments show that a pound of weight taken from the sow will make more than 1lb. of gain on the pigs, the flesh of the young animals containing more water. The sow should be fed to produce a high yield of milk, and the pigs should be kept with her until they get to eating a full feed of both grain and pasture. When the time comes to wean the pigs, cut down the sow's ration to water and a little grain. Take away the stronger pigs first, leaving the weaker to suckle for a few days. This method will give the weak pigs an extra chance, and will dry up the sow without injuring her. When she is giving a large supply of milk and all the pigs are taken away at once her udder is often ruined and she becomes unable to suckle another litter. When first weaned, feed the pigs from three to five times a day. While with their mother they took their meals at least every two hours, and too sudden a change is detrimental.

After they get to growing vigorously cut down to two meals a day, and when they weigh 75lbs. each and are on good pasture, feed once a day and that at night.

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Breeds of Pigs.

— The Tamworth. —

Some time about 1812 the Tamworth breed was introduced into England from Ireland. It is strictly a bacon hog, remarkable for its lean, juicy hams and long sides, that make up into the best of breakfast bacon.

Distinctive features of the bacon breed are the form and growth of its middling. In most pigs you will find that part of the middling running from the belly halfway up the side quite thin comparatively, the part running from that point up to the backbone quite thick and fat, also that portion next the shoulder thick and fat, with no lean streaks. These thick, fat pieces are cut off by curers and sold for about a little a pound less than that which is streaked with lean, and used to make high-priced breakfast bacon.

The Tamworth has been bred for several generations with a view to shaping this middling up differently, and now we have a hog that will produce a side of almost equal thickness from belly to backbone, and from shoulder to ham, well-streaked with lean throughout, nearly all of which will make up into the choicest breakfast bacon. Tamworths in colour should be rich, golden red, should have long, straight backs, slightly arched, long, deep sides, light, narrow shoulders, jowl very light, which gives nose rather long appearance, ears erect, and legs long with stout, flinty bone. The head being the least valuable part of the hog, you can draw your own deductions as to which breed has the most waste in head and snout. Tamworths are remarkable for hardiness of constitution, great prolificacy, and their wonderful success in rearing every pig born. Notwithstanding their size, with a nest full of pigs they very seldom overlay a pig.

It is recorded that one sow has brought eight litters in three and a half years, and she saved and raised 83 pigs. From fourteen to seventeen pigs are not unusual, and from ten to twelve pigs can be depended on nearly every time from an aged pig. As high as twnty-two pigs at a litter has been recorded. They are great grazers and foragers. Tamworth sows with a litter have been known to go four miles away and bring their pigs home at night. They are ripe to kill at any time. Raisers usually slaughter them at six or seven months, when they should weigh something over 200lb. They prefer, as breeders, pigs that reach a great size, so that the offspring will reach a killing weight of about 200lb. at a tender age. They are very large, the sows usually weighing at maturity from 600 to 1,000 lbs.—"American Agriculturist."

◆

Animals develop rapidly, have strong muscles, and the breeds improve, when the pastures have been well fertilised with a phosphate. Phosphates act directly upon the bones of the animals, which are composed largely of phosphate of lime, supplying the needed material for repairing waste tissue and building up new cells.

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Steady, slow work will give a stallion harder muscles, more stamina, a better constitution, and help him to get colts with a strong instinct for work. It is altogether contrary to the nature of a horse to keep him in idleness between seasons, besides the expense, when he might just as well be earning his keep. Breaking a stallion to work is not an impossible task either. He may be ferocious at first, but with a steady mate and perseverance the job can be done. If it happens that there is horse power enough on the farm without the stallion, give him plenty of chance to exercise and live a natural life. Nothing does the horse business to much harm as to keep over-fed stallions year in and year out for breeding purposes. The best thing for a stallion in the fall and winter is work, and the second best is all the exercise he will take and light feeding.

Rotation.

"The value of a judicious rotation is not taken at its true worth," writes an agricultural paper. "notwithstanding all that has been said upon the subject. In many instances it is not taken at half its worth. In certain experiments it was found that as much wheat was obtained in the one instance from three crops grown on the land that had produced grass during the three previous years as was obtained on similar land that produced wheat only during the same six years. The land in both instances was old and worn. In the first instance, the three crops of grass were secured in addition to the wheat. No fertiliser was used in either instance. The increase in the yields of wheat must be attributed to the influence of the grass roots on the exhausted soil. How long will it be before vegetable matter is taken at its worth? The most practical way of putting such matter into the soil is by growing on it a crop of grass or clover."

The Horse.

A horse's head indicates his character very much as a man's does. Vice is shown in the eyes and mouth; intelligence in the eye and in the breadth between the ears and between the eyes; spirit in the eye and in the pose, in the mobile nostril and the active ear. The size of the eye, the thinness of the skin, making the face bony, the large, open, thin-edged nostril, the fine ear and the thin, fine mane and foretop, are indications of fine breeding, and accompany high-strung, nervous organisation, which with good limbs and muscular power, insures a considerable degree of speed in the animal. The stupid, lazy horse that drivers call a "lunk-head," has a dull eye usually, a narrow forehead and a contracted poll. He is always a blunderer, forgets himself, and stumbles on smooth ground, gets himself and his owner into difficulties, calks himself, is sometimes positively lazy, but often a hard goer. He needs constant care and watchfulness on the driver's part. A buyer of fine equine flesh should be able to detect the good and bad qualities of the animals he contemplates purchasing. This valuable knowledge is only acquired by a careful study of the various parts of a horse's physiognomy.

Drying-Off Milch Cows.

Drying-off should be gradually done. If the cow has been milking lightly leave a little milk in for a week, and then milk every second day, but not right out, taking about a month to dry off. Cows should be milked from nine to ten months in the year. If milked too close to calving, the cow seldom proves as profitable to within 50 per cent. of what she would if she had had a rest, and the progeny is generally weedy, having a poor constitution. The feed on to which the cows are turned should not be too fattening. If allowed to get too fat, very often milk fever sets in immediately after calving. If on good pasture, it is well to take them in ten days before calving and give them food which is not calculated to make much milk, and a bran mash has a good effect in cleaning them out.

It is often necessary, in the case of heavy milkers, to take a small amount of milk away for ten days prior to calving. The cow should be watched carefully when parturition is about to take place, and no assistance should be rendered unless in extreme cases. It is important that the health of the cows should be studied, for upon such depends the condition of the calf. If the weather at the time of parturition is cold, stable and rug the cow, and give her lukewarm water to drink.

The period of gestation is about 275 to 280 days. After parturition has taken place, the calf may remain with the cow for not more than a day. The cow should be milked out as soon as possible. In some instances where the cow refuses to clean her calf a little salt should be sprinkled on the calf, when she will clean it down. She should receive laxative food—hot bran mash for deep milkers, or half a pound of Epsom salts. If the udder is hot and caked, milk every three hours, but not quite dry, steam the udder with hot flannels, and rub camphorated oil on it.

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Use the manure on the farm. Do not allow the best part of it to leak out, and run away. Put it where it will feed the land, and the land will feed the owner.

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Printing Butter Direct From the Churn or After Cooling.

Whether butter should be printed direct from the churn or after it has cooled a few hours is one of the questions discussed in a recent issue of the "New York Produce Review." Some correspondents favor one method and some the other. Making up the prints after the butter has been hardened in a refrigerator for some hours tends to lessen the loss of moisture and gives a print with better edges and one that will wrap and handle better than prints made from the fresh butter. There are machines made now for printing butter and these make the printing of refrigerated butter comparatively easy. There is much to be said on both sides, however, and if the butter is firm and the moisture well incorporated, satisfactory work can be done by printing direct from the churn. One correspondent puts the case for printing after cooling as follows:

"Packing the butter in the boxes is the same as packing it into tubs, the moisture cannot escape so easily and thus is retained in the butter. Butter can be packed into tubs and set in the refrigerator to harden, then the tub stripped and the prints cut into the desired size, but this makes another loss besides the inconvenience of having a lot of odd shaped pieces left to sell either as bulk butter or to repack, which cannot be done satisfactorily when it is hard. Another thing in favor of the box print is that after the butter has become hardened one can obtain a much nicer looking print—one that has sharp edges and is true on all sides, perfect in its shape. This kind of a print can be wrapped a great deal better, easier and nicer, and makes a neater appearing package to present to the consumer, which goes a long way in building up and retaining a reputation for the creamery's goods. In shipping prints locally or to distant markets, it adds considerably to the price of the butter if upon opening up a box the dealer and purchaser both see a nice, even lot of prints, all of them folded with clean-cut and sharp points, all lying the same way, either on ends or flatways. The same applies to tub butter; the appearance goes a good way with a prospective buyer.

"This cannot be obtained when the butter is printed direct from the churn, as one cannot print it unless it is in decent shape to handle. Then one cannot turn out as nice a sharp-edged print, nor will it wrap so easily as it will after being let stand in boxes to harden. Of course, with the 24-pound printers having the butter upon expanding trays, it can be set away to harden, but at the same time the butter is exposed to the conditions of the air in the refrigerator, whether good or bad."

Quittor.

A name given to a fistulous opening upon the heels and quarters of the coronary band, and is caused by treads, pricks in shoeing, bruises, and suppurating corns. Any injury which will cause suppuration within the foot will usually cause matter to form at the coronet, and may result in quittor. The disease is indicated by a swelling upon the coronet where the hair and hoof meet, great lameness, and a discharge of thin or thick curdy pus. There may be one or a number of small openings leading down into the sensitive part of the foot. The parts surrounding the quittor swell the become hard, and take on an unhealthy action, and are difficult to cure, and may be permanently diseased.

Clean the foot, and put it into a bran poultice for several days, then remove any horn that may be pressing on the sore part. If it is at the heel remove the crust with a knife; if it is in front of the hoof rasp it thin. Then probe the opening at the top to find the depth and direction. Put a grain of bichloride of mercury into tissue paper, and roll it into a cone, and press it down to the bottom of the opening. Treat all the openings in the same way. Put the foot into a bag to protect it from injury, and let it alone for three days, then clean out the openings, and put in some more of the bichloride of mercury, and so on for two weeks, or until the parts become healthy and the hard swelling has decreased; then make up a bath of chloride of zinc one ounce, cool water one gallon; put the foot into this twice a day for twenty minutes at a time. As soon as the openings are healed blister the coronet with the following:—Mix two teaspoonfuls of cantharides with four tablespoonfuls of lard; repeat in two weeks if necessary. When it is time to put on a shoe, and work the horse, a bar shoe will be best. If the animal has much fever in the early stages of the disease give a dose of aloes, and follow this by giving two tablespoonfuls of nitrate of potassium twice a day in bran mash. Later in the disease give a teaspoonful of sulphate of iron once a day in bran mash as a tonic.—"Farmer's Veterinarian."

Sore Teats.

The following ointment is recommended by a farmer for sore teats:—"Melt about ½ pound of fresh lard, when melted throw in a good handful of good, strong green eucalyptus leaves, boil very gently for about half an hour, or until the liquid becomes a not too pale green, take out the leaves, and add a piece of resin the size of a marble ½ an inch in diameter, well powdered, stir, and let simmer for 20 minutes. Then it will be ready to bottle, or better, place in two or three small pickle-bottles well corked. Wash the teats night and morning, and apply the ointment, and the worst cases will be cured in a week."

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Breed is not all there is to a good horse. Care and feed play quite as important a part.

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Lampas.

An experienced veterinary surgeon has pointed out that lampas is inflammation of the mucous membrane covering the bars of the palate, situated immediately behind the upper row of incisor teeth of the horse. It may arise from teething in young horses, or it may be induced by hot food, or irritating medicine not sufficiently diluted. But it is a very rare affection, although stablemen as a rule consider that every horse which has prominent bars has lampas. It is difficult to understand how the idea of lampas, being a common affection of the horse's mouth, should have found such universal acceptance, because of all the domestic animals the horse is most frequently examined while the animal is in a state of healthy; consequently one would think that the normal condition and appearance of the bars of the palate would have been ascertained with something like exactitude by this time. Such, however, is not the case, for I have met few non-professional men in this colony who appear to be familiar with the normal condition and appearance of the bars of the horse's palate. The history of this imaginary disease is somewhat as follows:—A certain horse refuses his food some mornings, or he looks dull and dejected, and does not feed with his ordinary relish. The groom, having a strong predilection in favour of this affection, at once examines the mouth, and finding the front bars of the palate level with, or perhaps even below the level of, the incisor teeth, immediately pronounces the animal to be suffering from lampas. He does not stop to examine whether the bars are inflamed in appearance or tender to the touch, whether it is their natural condition, or whether the bars of the palate of any of the other horses in the stable present a similar appearance. This obvious process of reasoning does not occur to him.

"As a matter of fact, in nearly all young horses, and in a great many old ones which graze on the veldt, and have not been interfered with, the front bars of the palate are on a level with and frequently lower than the teeth, but their position in that respect is no indication of disease, nor of any inconvenience to the animal. On the contrary, they are of great advantage to the horse, as anyone who watches them while grazing will observe. The horse gathers the grass with his lips, and cuts it with his incisor teeth, but he requires to hold the grass firmly in his mouth to enable him to cut it, and this he does by pressing the grass between the point of his tongue and the bars of the palate. This explains why a veldt-fed horse has these bars more fully developed than a stall-fed horse; the latter does not require to use either his incisor teeth or the bars immediately behind them, when feeding.

"Let us consider what further symptoms a horse would manifest which was suffering from an inflamed or tender mouth, but was otherwise in perfect health. Such a horse would attempt to feed, but would manifest a difficulty in mastication, and this would be accompanied by a flow of saliva from the mouth. But in the so-called cases of lampas neither of these symptoms is present; the horse either does not attempt to feed, or his food does not appear to be doing him any good. The whole of the symptoms clearly indicate that there is something wrong with the horse's general health, on which, being attended to, the apparent lampas will relieve itself.

"I have enlarged on this simple subject in order to try and induce horse-owners to abandon that barbarous practice of burning out the front bars of a horse's palate whenever he appears to be off his feed a little. Should the bars of a horse's mouth really become inflamed and tender from teething, or from eating or drinking any hot or irritating substances, or from mistakes made in the administration of medicine, the treatment should be of the simplest character. If the bars are much swollen or inflamed, lightly scarify them, and rub in a little common salt or alum, or both combined. Feed on soft food until the pain or tenderness has passed off. It is generally advisable to give a pint of raw linseed oil or some saline laxative in his food for a few days, as it is frequently associated with indigestion."—Agricultural Journal of Cape Colony.

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Use and Abuse of the Spur.

The ambition of almost every lad as soon as he can balance himself on a horse or pony is to decorate the heel of his boot with a spur. Go where one will, on farm or station, the spur is ever in evidence: father and son, manager and men, and even the barefooted blackboy attaches this persuader to his heel. In nine cases out of ten especially where long stages at a walking pace represent the rider's mission, the tendency is to make too much use of the spur. Persistent digging in the ribs either produces callousness on the horse's part, or works up a sore patch on its side, according to the degree of the sharpness of the instrument itself. Spurs are a necessity on some horses of a loafing, sluggish temperament, but to take due effect they need to be used with an amount of discretion that is seldom found to be one of the attributes of their use. Many riders, especially men with good hands—a particularly rare class—can acquire the art of moving their horses about by means of a slight touch of the spur; but with such artists blunt rowels, or dummy spurs, will do just as well as sharp ones. As a generally principle, sharp spurs are not necessary for ordinary riders, except in the case of obstinate horses that are inclined to stick up. The writer has in mind the manager of a northern cattle-run who never wore spurs and would allow nobody, old or young, white or black, to mount a station horses with any such decoration. His argument amounted to this: that a switch, or the heel without spur, would do all that was necessary to liven up any horse on road or run, for slow or for fast work: that the merit of the spur as an incentive to extra effort lay in the art of its application, and that few understand that. On camp stockhorses were naturally quick and lively, and required no such stimulus; if they did, and failed to respond to a switch, then they were out of place on camp, and a more desirable mount should be requisitioned.

Fifteen years ago no stockman seemed to consider his personal equipment perfect without a pair of toasting-forks, long, straight spurs with a five-inch neck, a ludicrous and utterly inefficient instrument of torture. The inefficient part of the proceeding lay in the difficulty of applying the rowels where intended along the flank—more often than not much execution was done upon the shoulders; whilst the ludicrous part received demonstration when the wearer, when off his horse, attempted to regulate his walking movements with becoming dignity. The long-necked spur found its way to this country from the English hunting-field, where young bloods affected them on the plea of being able to tickle the flank with less effort than with the shorter-necked variety. As attached to a stiff hunting-boot, there might have been something to be said in favour of the toasting-fork being more humane, but with men "cutting an occasionaly voluntary," and being shifted about in their seat by an occasional peck on landing over a fence, the shoulders and other parts of the horse's anatomy soon explained away the force of this argument. In England hunting in spurs is the fashion, largely due to the way in which a well-made spur, neatly buckled on, sets off a top-boot. But in that country hundreds of hunting-men wear dummy spurs, which either have no rowels or have threepenny-pieces let in to take their place. These when applied even with force inflict no domage upon the skin. What the present Hurlingham law may be with regard to the use of spurs at polo the writer cannot say, but thirty years ago blunt spurs of the above description only were allowed at polo.

One sees horses entered in the metropolitan and other Show rings to compete for prizes as hacks, where paces and manners play an all-important part. As often as not the rider will be wearing a pair of brutally-sharp persuaders. The appearance of the rider thus armed for action must ever be a great handicap to any horse's reputation as a hack. In jumping competitions among local hunters a huge majority of horses are so willing that they will do their utmost without any such stimulant as a spur; they will jump, clout, or fall over every obstacle they are put at. Irresolute riders make great play with spurs, but as the horse usually understands the language of funk on the rider's part better than the action of his heels, the spur in such instance becomes an indication to stop. A real horseman may use spurs to assert mastership, but he will not select the moment of his mount approaching a fence with shortening stride and all attention for the leap as the time for application. To spur a willing horse doing his best is to distract its attention from the task in view.—Elder's Review.

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The best fleece will ever be the mark of the best sheep, provided, of course, that it has a good thrifty form.

Stack Building.

The art of stack building, like every other accomplishment, can only be acquired by actual practice. Stacks built on the ground should have a foundation of straw or other suitable material. Assuming that it is intended to build a round stack, the circumference should first be marked out, then set up a couple of sheaves in the centre, and another couple against their sides. Pile other sheaves against these in rows round the centre, with a slope downwards towards the circumference, each row being placed half the length of the sheaf beyond the inner one, till the circumference is completed. Keeping the circumference of the stack on the left hand, the stacker lays the sheaves upon the outside row round the stack, each sheaf being placed in the hollow or intermediate space between two of the sheaves laid in the preceding row. When the outside row is thus laid, the inside one is made with sheaves whose butt-ends rest on the bands of the outside row, thereby securing the latter in their places, and at the same time filling up the body of the stack firmly with sheaves.

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In England the cultivation of watercress represents a growing industry. One firm of growers employs forty men and spends £2,000 a year in wages.

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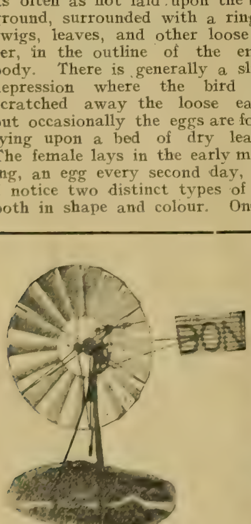
The Ways of the Emu.

Many years spent in wandering over the wilds of the Mallee—always, I hope, with an eye quick to catch any movement of bird or beast, and ear keen for any new note in the bird harmonies of the scrub—has enabled me to see a good deal of the ways and nesting habits of the emu, writes "Mallee Bird" in the Australasian. It breeds often enough in captivity, but to realise its natural habits one must see and know it in its native haunts. I have reason to think that in selecting its nesting place the emu has some strange fore-knowledge of the weather—call it instinctive or what you please—because I have noticed that in seasons which have turned out very wet the bird frequently builds its nest on high ground, and, as the nesting season begins often as early as June, and extends to November, the nest site has to be selected before the winter and spring rains have fairly set in. The nest is generally placed amongst low scrub upon a slope facing the rising sun; but in seasons which afterwards turned out to be exceptionally dry, I have found the nest on low ground, even in depressions. The lignum swamps are another favourite nesting place, and there, of course, the bird usually selects one of the hummock islands. Building the nest is not a matter of much importance. The eggs are as often as not laid upon the bare ground, surrounded with a ring of twigs, leaves, and other loose litter, in the outline of the emu's body. There is generally a slight depression where the bird has scratched away the loose earth, but occasionally the eggs are found lying upon a bed of dry leaves. The female lays in the early morning, an egg every second day, and I notice two distinct types of egg both in shape and colour. One of them is pale green, and round in shape, in contrast with the other, which is more of an oval or pear shape, the shell a deep dark shade of green, and much thinner than in the other type.

From the time the last egg is hatched until the first downy chick is hatched varies from 54 to 57 days, and that is the period when the birds form a most interesting study. As far as my personal observations go, a full clutch varies from seven to eleven eggs, the greatest number I found in one nest was seventeen, but in this instance I think two birds laid in one nest. There is a good deal of controversy upon this point, and it is a matter upon which few naturalists are able to get direct evidence, but on two or three occasions I have satisfied myself that a pair of females used the same nest, and have studied the tracks of the birds closely in order to make sure of it. My opinion is that in every case where an exceptional number of eggs were found in one nest it was used by more than one female. One day I found a most remarkable clutch in a nest placed in dry lignum, which contained seven emu eggs and a a pair of native companion's eggs. I intended to watch that nest closely for results, but unfortunately it was raided by an egg-collector, who had no curiosity as to what would happen when the companion chicks were, in the natural course of events, first hatched. These two eggs were placed in the centre of the emu clutch, and I noticed a pair of native companions feeding in the locality.

The emu's habit of drumming near the nest is one of the best aids in finding it. The female generally drums in the evening, and by drawing a straight line on the ground in the direction of the drumming you have a pointer in searching for the nest next day. In the laying season the female generally booms early in the evening, about twelve resonant notes in succession, with a short interval between each. The drumming of the female is loud and rather harsh towards the end of the call, the note of the male, sharper and more distinct.

Few birds of the bush take a larger share in the hatching and rearing of the family than the male emu. He is the first to sit as soon as the clutch is complete, and rarely goes far from the nest site from the time the first egg is laid until the young are hatched, while the female, during the day when she is off duty, wanders over a considerable range of country. She generally returns to the nest towards the evening, and relieves the male bird for an hour or two each night, commencing about the second week and continuing from fourteen to twenty nights. Afterwards the male has complete charge, and though in the early stages of incubation he only sits from two to four hours each day, at a later period he seems loth to leave the nest even when alarmed. At first, when any suspicious sound excites the vigilant male, he leaves the eggs at once and sneaks away stealthily through the scrub. At the end of a few weeks, however, even with an intruder close by, he crouches low upon the nest with his head and neck flat upon the ground and his sombre plumage is then so closely in harmony with his surroundings that he is not easily detected—a surprising circumstance with a bird so large as the emu. The female may generally be seen making a straight line for the nest in the evening, and wandering off from it again at dawn. Nearing the nest the course of both birds is always erratic, they circle about it for a time, approaching from all points of the compass. However the trails may vary they all unite at one point, and thence for about fifty yards there is a straight line for the nest, which, from much tramping, finally becomes as clearly defined as a beaten "pad." Even when the female lets him off duty for a few hours at night the male is never far distant, and on the first sign or sound of alarm the faithful sentinel makes straight for the nest, his feathers ruffled up in fury until he looks quite a formidable adversary. If the intruder be a tame dog or a dingo the bird goes straight at him, pecking and soon drives him off. The male emu is a match for more than one



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dingo. I have on occasions seen him keep two or three hungry dingoes at bay, and after a battle lasting perhaps twenty minutes, drive them off, though they prefer the flesh of the emu even to that of the kangaroo, and manage to kill a great many of the birds when partly grown.

After the young are hatched the female still takes the lesser share of the trouble. For two or three weeks both parents are in charge of the brood. When they are wandering in search of food or water the male is invariably the advance guard, while the hen brings up the rear, but when the mother fir leaves the family as they gain strength the "old man" changes his tactics, and always follows the young. With them it may be truly said that eternal vigilance is the price of safety, and for his natural enemies the male emu is ever as alert as he is intrepid. He is quite aware that the dingo, whom he has most to fear, is likely to attack the young from the rear, through having first crossed their trail and then following up the scent. Hence his change of disposition as soon as the hen deserts him. Any suspicious object seen for the first time greatly excites his curiosity. Standing stock still for a while, he investigates the strange object closely, then, with head and neck poised, slowly approaches it, uttering now and again that booming note peculiar to his kind, flapping his tuft-like immature wings as the birds always do when drumming. By hanging a piece of bright red cloth upon a bush it is possible to decoy the bird close up to the spot where you are lying in ambush.

Like many other of our larger birds, the emu has of late years been obliged to seek fresh woods and pastures new. Civilisation and progress have crowded him far back into the waste places, so that no man's land is now emu land in Victoria. In the arid heath country and so-called desert mallee at the back of Pine Plains Station he is still fortunately fairly abundant, and there in long journeys on long, quiet days, without a human being perhaps within fifty miles of me, I have had full opportunity of studying his ways. He roams singly or in pairs, but when in search of water the birds have a tendency to flock, and one often sees from half a dozen to twenty in company. The largest flock I have seen for many years past numbered 43, and the dry season was undoubtedly the cause of the birds congregating in such numbers. When on the march for water you can never mistake their purpose, for their troop is usually a pitiable sight. They are invariably travelling southward, one of the males in the lead, followed by the rest of the flock, each with wide-open and gasping mouth. They must be suffering extreme agony of thirst, and a man must have done his "perish" somewhere to fully realise what that means. The weary, exhausted attitude of each bird gives you the impression that it may collapse at any moment. These periodical sufferings from thirst are the penalty which the emu has to pay for safety. How very different the spectacle of a troop of emu feeding in one of the mallee glades, where both food and water, if not abundant, are at least sufficient. Many a time I have watched them with interest. Perhaps in some area of dense mallee you come suddenly to the edge of one of these grassy plains, with eight or nine emu feeding upon the succulent herbage which often grows in abundance there. There is the ever alert male bird standing sentinel, with head and neck daintily poised. The sombre plumage of the others is lit up by the sun's rays, which bring out blue and golden tints against the green background of mallee, never seen when the birds are in a shadow. It is a beautiful animated picture of the bush. The bird has a great partiality for the heathy scrub, for there it usually finds a low bush bearing in spring a prolific crop of sweet red berries, which seem to me to be the emu's daintiest dish. In the season they are always in search of it, and they have a great partiality, too, for the fruit of the quandong, which is one of the conspicuous trees of these mallee glades. Possibly in this brief sketch I have been able to add something new to the life history of the emu, and to those ornithologists who may differ with me as to their habits, I can only say that I write of what I have seen and personally studied, taking nothing for granted on the strength of a single impression, and verifying as far as possible all my observations. To get such opportunities for investigation now one must travel far and alone. The student of bush tracks—and to be a successful dingo hunter one must be a good tracker—often finds a strange impression in the loose earth. Like the dingo, the emu, when on the move, has a great preference for old bush tracks and cattle pads. The dingo hunter sets his traps along these tracks, and the emu often springs a trap that was not intended for him. It rarely happens, however, that a dingo trap is strong enough to hold the emu, which either kicks until the trap is smashed, or, when that fails, the bird's toe is cut off in the struggle, and at that price it gets its freedom again. The number of tracks one sees where the impression of a toe is wanting shows that the incident is not at all unusual, especially during droughts, when the emu is on the march for water.

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Live stock can never do well when subjected to frosty nights and cold rains with insufficient feed.

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The Newly-Born Foal.

Navel evil is a very serious complaint among foals. An experienced writer on stock-breeding in the Live Stock Journal attributes the cause of this ailment entirely to cutting and tying up the navel cord. Horses in a wild state, as in the bush, have nobody to cut the cord, and they do not bite it off, therefore it must be broken off when the mare gets up. In cutting the cord a small hole is left, like the stem of a pipe; that is where the poison enters and kills the foal. In pulling the foal away until it breaks, the cord becomes stretched, and there is no hole left in it, and the foal is safe. This is Nature's way, and there can be no doubt but that it is for this reason alone the best.

Sometimes the mother's milk disagrees with the foal, curdles on the stomach, and causes scouring. A tablespoonful of castor oil in a little of the mother's milk should be given. This carries the cause of the mischief away through the bowels. The danger with foals lies in their becaming costive; foals that scour lightly generally do well, and grow fast. A foal should be allowed to suck for at least twenty weeks. If weaned too young it does not get over it that year, and a month or six weeks longer with the mother works wonders. If the mare can be spared, the longer the foal sucks the better. If worms appear in the excreta of the foal, give plenty of salt in a bran mash early in the morning, when the little animal is hungry; worms do not like salt.

If the mare is healthy, the ninth or tenth day after foaling is the best time to put her to the horse again, unless it is desired to let her miss a season. Some advocate alternate years, and the policy has some advantages to recommend it. If she misses then, the period will return in another fortnight.

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The First Calf.

Among dairymen, as among other classes of men, run certain traditions and notions. Some are sound, and some we believe are essentially unsound. Among the unsound ones is the notion that the first calf, whether male or female, is not apt to be up to grade with those that come after. We could never see any sense or reason in this idea. A cow breeds from her inherent nature, that which she has inherited from her ancestry. If she has a strong inherited quality, why should she not impart it to her first calf? If she has not inherited such quality, will she ever impart it? It is of a good deal more moment to us to know that the heifer gives evidence of a strong dairy inheritance than anything else. One of the finest we ever owned was the first calf of a heifer. He was unusually prepotent, and produced for us some very fine cows. We are now keeping for use in our herd the first calf, a bull, of a heifer that promises to make 400lb. or over of butter-fat in her first twelve months of milk-giving.

One of the most important things to accomplish in dairy breeding is to unite male and female in a way that shall enlarge the dairy capacity in the resulting progeny. Then comes the careful rearing of the young animals so that whatever good quality they may have inherited, from this wise breeding, shall be stimulated and developed to its full bent.

We have a great abundance of unwise breeding, and a still greater abundance of unwise rearing, of the calf to a breeding age. But to go back to our first thought. We would say that so far as our own experience goes, as well as the careful observation of others, there is no foundation for the belief that the first calf of a heifer will not make as good an animal for breeding purposes as any subsequent progeny.—Hoard's Dairyman.

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Windgalls.

Windgalls are the result of hard work, leading on to dropsy of the joint and surrounding tissues. With regard to remedial measures, the best and most lasting effects are produced through fireing, though, of course, a blemish results. If the swelling is recent and small, it may at times be got rid of by blistering, or the daily use of iodine ointment. If long standing, and the horse is old, perseverance with the treament mentioned is necessary. Light work is beneficial.

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Lime in the Dairy.

In all Danish creameries barrels containing lime water occupy a prominent position. The creameries, which years ago practiced the steaming of all churns and other dairy utensils regularly in order to keep them sweet and pure, now simply scrub them in hot water, and while the surface is still warm, apply with a brush a generous coating of thick limewash, which is partly absorbed by the pores of the wood, purifying, and making it bright and firm. The surplus lime is afterwards washed off; in fact, it appears that lime takes the place of washing soda, being much superior for creamery purposes, and a great deal cheaper as well. Lime removes grease and sour smells from floors and utensils, makes tinware brighter, and the grain of wood firm, bright, and loose.

The by-laws of some creamery associations strongly recommend suppliers to use lime for cleaning their milk vessels, as well as for whitewashing stables, milk houses, etc. The formula for preparing lime water in which utensils may be immersed is thus given :—" The

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solubility of lime at ordinary temperature is one part in 700 parts of water. Such a solution would be termed saturated lime water. Translated into pounds and gallons, this means that 1lb. of lime is sufficient to saturate 70 gallons of water. However, owing to impurities in commercial lime, it is well to use more than is called for in this statement. If good, freshly-burnt quicklime can be obtained, 2 or 3 lb. to 5 gallons (50 lb.) would thoroughly saturate it. The method of preparation is simply to slake the lime with a small quantity of water, and then stir the milk of lime so formed into 5 gallons of water."

Out-door Paint.

A good outdoor paint is made as follows:—Stir into 1 gallon of milk about 3lb. of cement, and add sufficient Venetian red paint powder to impart a good colour. Any other coloured paint powder will do as well. The milk will hold the paint in suspension, but the cement being very heavy will sink to the bottom, therefore it is necessary to keep the mixture stirred with a paddle. This extra work is the only drawback to the use of the paint, the effectiveness of which depends on the woodwork getting a good coating of cement. Six hours after being applied this paint will be immovable, and impervious to water. It can be made with skim milk, but whole milk is better, as it contains more oil, and this is the constituent which sets the cement.

Do Cows Require Salt.

As the result of a protracted series of experiments a dairy expert sums up the results as follows:—"In every case the cows exhibited an abnormal appetite for salt after having been deprived of it for two or three weeks, but in no case did the health of the animal, as shown by the general appearance, the live weight, or the yield of milk appear to be affected until a much longer time had elapsed. This period of immunity varied with the individual cows from less than one month to more than a year. In every case there was finally reached a condition of low vitality in which a sudden and complete breakdown occurred, from which recovery was rapid if salt was supplied. This stage was marked by loss of appetite, a generally haggard appearance, very rapid decline in both live weight and yield of milk. The breakdown was most likely to occur at calving, or immediately after, when the system was weakened, and the flow of milk large. In general the cows giving the largest amount of milk were the first to show signs of distress. They all suffered less in pasture than when confined.

"The success in these experiments must be chiefly attributed to the exceptionally long periods during which salt was withheld. In no previous tests, so far as the writer knows, have cows been deprived of salt for more than thirty consecutive days, which period is shown to be entirely inadequate, under conditions which exist at this station. The twenty-three cows that were deprived of all salt in our trials all continued for more than sixty days, and several of them for more than six months, before any noticeable effect upon their physical condition or yield of milk occurred."

Success in Preventing Abortion.

The Live Stock Journal reports an account of the great success which has resulted from the use of carbolic acid internally as a preventive of abortion by many of the leading cattle breeders of England. This applies, of course, to contagious abortion. The manager of one of the most noted British herds of Shorthorns, was one of the first to try the remedy and met with such success in its use that he called public attention to the value of the treatment. His plan of administering the carbolic acid was described by him as follows:—

"I commence by mixing with sufficient hot water to make a bran mash ¼ ounce of ordinary crude carbolic acid and then add the bran, gradually increasing the carbolic acid up to ½ ounce, which is the maximum quantity I can get a cow to take in a bran mash. For a number of cows I measure out the requisite number of ½ ounce doses and mix with the water and bran in a fodder barrow and then divide in equal portions to the different cows. I administer the carbolic mashes three times a week. I find it equally safe to give an animal a ½ ounce dose daily."

Food Value of Milk and Cheese.

Although milk has been used as food throughout all the ages, and most people use it from birth to old age, yet very little is understood by the average person as to value of milk and milk products. Now that food values are increasing the food value of milk should be better known. The greater use of milk would be a great saving to the consuming public. Greater attention is being paid to the producing of milk under conditions that will insure a pure product. The most effectual way to bring about more up-to-date and progressive methods in handling milk to insure its purity and cleanliness, is to pay better prices for the milk.

Scientists tell us that a quart of milk is of equal food value to a pound of our best beef steak, yet the consumer kicks about paying more for milk giving as a reason that he has to pay so much for meat. If he is looking for an economical ration, why eat meat at all? Cheese can very well take the place of meat. In fact the old country laborers use cheese instead of meat.—"Canadian Dairyman."

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Earth Worms.

Angle worms, or as better known, "earth worms," are little and, apparently, insignificant things, common in most countries, of no value, one would think, to any body except to the school boy at home for a holiday and bent upon an afternoon's fishing excursion, whence the term angle worm.

But, whoever thinks this of the creature errs greatly. The worm in question has done, and is still doing work of marvellous, even stupendous extent. It sounds like a fable to hear that, as a great writer says: "where we have reason to believe that some few centuries ago a city stood, we find a green expanse of pasture land, with here and there, perhaps, a few rounded knolls or mounds relieving the flatness of the scene. Turning up the sod beneath us, we probably came upon a fine black loam, suggestive of a deep, rich, virgin soil; but digging deeper, we may strike the marble plinth of ruined column, or some old mosaic pavement."

Many a man must have wondered amazingly at this strange problem: whence came this marvellous covering of long lost cities, temples, and other edifices, and it is only of late that the true solution is due, with many another, to the great Charles Darwin.

Darwin's first paper "On the Formation of Mould" was read before the Geological Society some 68 years ago, but the novelty of its views caused it to be received with a good deal of incredulity, and this, of course led to the author's determination to follow the matter up, and this further and deeper prosecution of the investigation led him to the conclusion that all the vegetable mould over the country has passed many times through the intestinal canal of worms.

And what are the habits and structure of this wonderful workman, the common earth-worm? He lives in holes in the ground; these they coat with leaves, to keep their bodies from contact with the damp cold earth. In winter, they completely close the entrance to these holes, and go deeper down, to get out of the reach of the frost or birds, even so deep as five or six feet.

As one would expect, from their structure, the food of these curious creatures is principally vegetable, but they are not by any means particular, though if they have a choice, perhaps it may be a little in favour of cabbage leaves; astonishing, but true, they do not absolutely refuse rose thorns and splinters of glass. Worms, though they cannot hear, are remarkably sensitive to vibration, as any one who goes after lob worms of a night for his night lines must have observed. You may see half a dozen with their heads, and some with half their bodies as well, out of their holes, and as long as you remain quiet so will the worms; but the moment you move nearer to the worms, the pressure of your feet causes the earth to quiver, and down go the worms at once.

After all the digestible matter has been thoroughly extracted from what it has swallowed, what does the worm do with the residue? And herein lies the wondrous key to the whole mystery. Our readers have, all of them, of course, noticed little heaps called worm casts. The fine earth brought up to the surface in these little heaps of worm excreta is afterwards spread abroad by wind and rain more or less uniformly over the ground; the actual weight of these castings thrown up during a twelve month being calculated in one case to amount to as much as eighteen and one-eighth tons per acre! Almost incredible, is it not? Now multiply this by a number of years, and we can easily understand how objects on the surface will soon be covered up, or appear to sink into the ground.

And such being the case, we can no longer wonder at the well known fact, so long a mystery, that the ruins of old cities have been found so far beneath the surface, that plough and harrow, rake and roller have been at work over them for years without any suspicion of their existence arising in the minds of the cultivators of the soil.—Journal of Agriculture and Horticulture.

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Brood Sows.

In considering the efficiency of brood sows, the following advice is worth following:—"Go over those that have had pigs the present year and ask them the following questions. How many pigs did you have this year? Were they even in size or form? Were they all good ones or did you have two or three choice pigs and were the rest quite inferior? How did you take care of these pigs? Are you a good suckler? Are you good natured? Are you a good mother, or are you one of the nervous, fidgety kind, always worrying for fear that somebody will hurt you and your precious piglets? If the brood sow, on being interrogated, cannot give satisfactory answers to these questions it is not worth while to scold her or give a moral lecture. Just turn her into the fattening pen; for there is where she belongs." — From Coburn's "Swine in America."

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Excess of food weakens a working animal and disables it. It induces indigestion, and is worse than a spare diet.

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Disinfection or Disinfectants.

Contagious diseases are caused by minute organisms, which belong to the lowest order of life known and are so small that they can be seen only with high power microscopes. The name "germ" is popularly used in speaking of these organisms. Some of them are plants belonging to the lowest order of fungi, and are called bacteria; while others belong to the animal kingdom. These germs gain entrance into the bodies of men and animals through the mouth and digestive tract, through the respiratory tract, or through wounds. They multiply in the body and produce disease.

The sick man or animal throws them out in matter which is coughed up, as in consumption or pneumonia; from the intestine or kidney, as in typhoid fever; or from the skin, as in small-pox or scarlet fever. It is, therefore, of the greatest importance to destroy the germs in all matter discharged by the sick. As long as the germs are not thrown out by the sick individual there is no danger to others.

When an animal dies of a contagious disease it is very important to destroy the carcase by burning. If this cannot be done it should be buried deep and covered with quicklime. Anthrax is frequently spread by neglect of these precautions. Birds, dogs, and other animals, feed on the unburied carcass and distribute the germs. Birds especially may carry the germs many miles.

— Disinfection. —

Germs vary greatly in their resistance to destruction by disinfectants. Many of them form spores, which correspond to the seeds of higher plants. These spores are very tenacious of life, and can go for many years without food or moisture. Many of them will resist boiling water for a few minutes, and no amount of cold yet tried injures them. Ice from dirty and infected water is often responsible for the spread of typhoid fever. The old idea that water purifies itself in freezing is only partly true, and cannot be depended upon at all where health is concerned.

The spores of anthrax will usually live for two days in a 5 per cent. solution of carbolic acid, and sometimes as long as forty days. This is perhaps the most resistant spore known, but all spores are hard to kill. Fortunately most disease producing germs do not form spores and are easily killed. The germs of anthrax and lock-jaw form spores which are very tenacious of life, but those of typhoid fever, blood-poison, influenza, diphtheria, tuberculosis, distemper, etc., do not form spores and are easily killed.

By disinfection is meant the absolute destruction of the germs of infectious diseases. If this is done by means of chemical substances these are called disinfectants or germicides.

An antiseptic is a substance which prevents decomposition by preventing the growth and multiplication of germs, but does not destroy their life necessarily. All germicides are antiseptic in weak solutions, but there are many substances which are good antiseptics, though not germicides in any strength. The best examples are common salt and sugar, both of which are largely used in preserving meats, fruits, etc. Cold also has a marked power to prevent the multiplication of germs, but does not destroy their vitality.

Sterilization means the destruction of all forms of life in or upon the surface of an object. When an object is sterilized it is also disinfected.

Deodorants either mask or entirely remove disagreeable odors. Some deodorants are good disinfectants, and some disinfectants are good deodorants, but there is no distinct connection between the two. For example, charcoal is a good agent to remove smells from putrefying material but does not kill the germs which cause the putrefaction. Formalin is a true deodorant as well as a disinfectant as it not only destroys bad odors but also kills the germs producing them. As a rule it is better to employ an antiseptic or germicide which has no smell of its own, as there is danger that the real state of affairs may be hidden or masked by the pleasant odor of the deodorizer, while the putrefactive process goes on without hindrance. It must be remembered that bad smells do not always accompany dangerous processes; and on the other hand, that the ordinary putrefactive processes, which give rise to very offensive odors, often destroy virulent disease germs.

The action of a disinfectant often depends largely on its solubility in water. For example, some oily substances have considerable power but do not dissolve readily in water, nor mix with it. A good example is found in the cresols, which are the basis of many commercial preparations. The general usefulness of these valuable agents is much increased by combining them with soaps as in creolin, etc., which mix readily with water in all proportions.

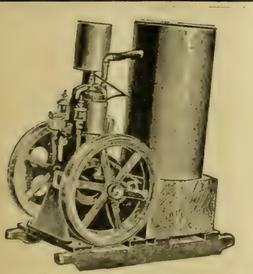
For complete disinfection of a room the gaseous disinfectants are the best, for the reason that the gas permeates every nook and corner reaching places that would not be touched in any other way. It is plain that the room must be tightly sealed to prevent the escape of the gas. This is easily done with strips of heavy wrapping paper and ordinary flour paste, put on with a paint of white-wash brush. It is easily wasked off and leaves no mark.

Gaseous disinfectants cannot, as a rule, be used in barns and stables, on account of the open construction of such buildings. Here we must depend on thorough cleaning, airing, and the use of some spray. If there is infected forage or bedding, it should be raked out and burned. Walls must be soaked with water, then thoroughly scraped. Burn all material, removed in this way. All rotten wood in floors, feed boxes, stanchions, etc., must be taken out and burned. Thorough cleaning will often make disinfectants unnecessary but no amount of disinfection will take the place of cleanliness. In cases of contagious diseases both cleanliness and disinfection must be employed.

— Applying Disinfectants. —

When using a disinfectant of any sort two things must be always

(Continued on Page 36).



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Farmer's Vegetable Garden.

It has often been remarked that the farmer who devotes his attention to breeding live stock or growing wheat, very often has to buy his cabbages. The truth of this is exemplified on many farms throughout the Commonwealth. Too often, on otherwise well-kept farms, the kitchen garden, which should provide many of the table necessaries, as well as being an essential factor in maintaining the health and comfort of all the members of the household, is, in the rush of work connected with other, and what are often erroneously considered, more important interests and crops, neglected until the last moment; The work is then roughly and also hastily done, the proper season for the planting of each crop is probably missed, and for a good portion of the year the kitchen garden is a weed-infested waste. The time spent in properly looking after a kitchen garden on the farm, instead of being considered wasted, and the money laid out in seeds and plants, so much capital lost, should be regarded as what it really is—one of the best-paying investments on the farm. If by careful cultivation and management, the garden is made to assume the important position it deserves, it will be found to be a valuable factor in making country life more attractive than it now is on the majority of farms. There is an immense amount of pleasure to be derived from cultivating and maintaining a kitchen garden in good order, and securing a regular succession of crops; while at the same time its produce is of most material assistance in promoting the health of the occupants of the farm. It seems an extraordinary thing that fruit and vegetables should be so scarce on the majority of farms, yet such is the case, while numbers of farmers purchase what they consume in the way of garden produce from the hawker. Give the garden a chance, and an illustration will be furnished of the advantage of the returns to be obtained from a portion of the farm which many farmers do not consider worth cultivating in a proper manner.

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Birth-Marking.

The question of the possibility or otherwise of the transmission of artificially acquired characteristics by parent to offspring has been a matter of discussion amongst stock breeders for numbers of years. The preponderance of opinion and evidence is undoubtedly against the existence of any such possibility. Occasionally, however, instances are reported which would appear to point to the fact that the contrary view is sometimes correct. In a recent issue of the "Live Stock Journal" mention is made of cases of calves born earmarked. In two instances the calves so marked, were the produce of earmarked cows, and it would perhaps be possible to argue that the ear marking of the parent was done during pregnancy but for the fact that in one case the same cow dropped three successive calves so marked whilst in the other we are told that "several calves were born with the "swallow tail ear mark of the female parent." Thus the theory of prenatal influence of a marked physical sensation suffered by the parent does not hold water. Another case quoted is that of a red Shorthorn bull, which sired a percentage of calves carrying a duplication of his stud mark at birth. It rather adds to the mystery when we read that only his red calves were so marked. The obvious objection to the transmission of artificial characteristics is to be found in the fact that there is no authentic instance of hog maned horses or de-horned cattle throwing maneless or hornless offspring. In the following issue of the paper a correspondent referring to the cattle born earmarked suggests a possible explanation as follows :—

"When at an agricultural show at Lerwick, Shetland, some years ago, I was struck by the large number of earmarked Shetland cattle, and asked a native of the island why it was the fashion to so disfigure them (the marks varied from a nick out of the points to, in some cases, both ears half off, apparently cut square in the clumsiest way). He replied he had never heard of such a thing being done, but that it was quite common for animals of this breed to be born with notched ears. I afterwards proved the truth of this when owning a few Shetland cows. More than one was earmarked, and their calves were born with pronounced V-shaped nicks in the point of each ear. I have since heard this peculiarity is not uncommon among West Highland cattle, and goes by the name of 'Palmer's lug mark.'"

This, however, only antidates the mystery and one has to ask. Did the first ancestor of all cattle have mutilated ears? if not, how, when and also why did the characteristic crop up and have its descendants in the course af untold years developed normally perfect ears? and if so, are the instances recorded above merely more or less marked reversions to ancestral type? Rather a far fetched idea because one cannot conceive that a ragged ear even in those primitive times could have been any advantage or ornament to its possessor or in any way helpful to it in the struggle for existence and anyway, it does not get over the unique performance of that studmarked bull.

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Dairying Industry Improvements.

At a largely attended dairy farmers' convention recently held at Manhattan, in the United States, one of the leading dairy commissioners, in his address, submitted some suggestions towards improvement that may be regarded as worthy of consideration by dairy farmers in many localities other than those in which this conference was held. "The question," said the speaker, "of how to improve the quality of butter has been, and will continue to be, one of the important subjects of interest to the State and nation. Upon this important question of quality hinges success or failure, loss or gain, to the dairy interests," and then proceeded to treat the subject in detail.

— Question of Quality. —

The question of poor butter has been discussed since butter making first became a branch of agriculture, and, judging from the reports from the best information that he could obtain, there never was a time in the history of our dairy industry that there was so much needed for improvement as at present. On this all agree, and no argument is needed to prove the fact that there is much need of improvement. I shall therefore try to define clearly a course I believe will have to be pursued in order that some improvement be made. No marked change need be expected in the quality of our butter until the quality of the cream delivered by the suppliers is improved, and all places where cream is received or handled are kept perfectly clean, and means provided to keep the cream cool until it is delivered to the creamery. The men engaged in buying cream should be qualified to select or grade the cream closely, and to instruct the supplier how to improve his cream.

— Too Many Factories. —

The managers of creameries have primarily been engaged to secure trade: and to create cream buying stations, until to-day there are 50 per cent. too many, run at an extra expense by men who will take any kind of cream delivered. It costs more to produce cream that is produced in a cleanly manner, separated by a separator that has been properly cleansed after each skimming, and to cool and deliver the cream while it is still sweet. We are paying a premium for an inferior grade of cream under the present conditions. The dairy farmers are students of the creamery, and they are producing the quality of cream they have been taught to produce.

— Means of Remedy. —

The creameries should therefore cease finding fault with the supplier until they have remedied all the defects over which they have control. If the creameries are to remedy these defects they must in the future co-operate, and consider each creamery's interest, and avoid doing anything that will create lack of confidence on the part of either the other factories or the supplier. The men engaged as district superintendents, if not already thoroughly conversant with all phases of dairying, especially pertaining to the production of first grade cream and the manufacture of butter, should be made to qualify, or give way to men who are competent to do this important work. While there are some of the superintendents doing good work throughout the State, I know, from what I have seen, that some of the superintendents know little of dairy work; at least, their work is of such nature as to justify this conclusion. Each cream buying station forms a part of the factory company it represents, and if not conducted in such a manner as would be in keeping with the production of the best quality of butter, it reflects discredit on the creamery, and discourages the supplier in the production of the best grade of cream. The cream buyer assumes a very responsible position, insomuch as he stands between the supplier and the creamery to do equal justice to both in the matter of cream testing. My experience during the past year has been sufficient to conclude that 75 per cent. of the cream buyers are either raising the cream tests with the object of securing trade or for want of knowledge of the test.

— Improving the Quality. —

In summing up how our butter may be improved, I would first say, by each supplier doing his part to produce perfect cream and delivering it to the creamery while it is still sweet, thereby placing the control of fermentation and the ripening process of the cream, which is essential to the production of best butter, in the hands of the butter maker, who is trained, or should be, to control and so manipulate his work as to produce the desired results. Second, by the absolute co-operation of the creamery men and the supplier; and this co-operation must come through the man who comes most closely in contact with the supplier, namely, the cream buyer. All cream buyers engaged by factory companies should be so engaged that proof of their receiving any rejected cream would disqualify them. They should not receive poor flavored, over ripened cream on any account, as one can of inferior cream is sufficient to deteriorate any amount of cream to which it is added. Let this organised, co-operative, educational manner of conducting dairy business be put into effect by the factories, and, aided by a well organised system of instruction, this would furnish the butter makers with cream of such quality as would encourage them to strive for a superior place in the markets, and secure that reputation which means good butter prices.—Journal of Agriculture and Horticulture.

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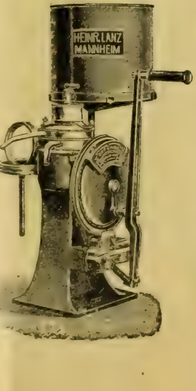

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(Continued from Page 33.)

remembered :—1, use enough of the disinfectant, and 2, give it time to act. Many disinfectants are decomposed while acting by the substances with which they come in contact. If a liberal quantity has not been employed, it is all used up before disinfection is complete. No general rule can be given for time. This is mentioned below in speaking of the different germicides.

Medicated soaps are usually worthless and should not be trusted. Most of them are not as good as ordinary soap alone. Soaps are useful mainly in making substances soluble, and assisting in cleaning surfaces, garments, etc. Most liquid disinfectants can be applied advantageously by using a spray pump.

— Physical Agents as Disinfectants. —

Sunlight is one of the most powerful germicides known, destroying not only the growing germ but also the spores. If we had means to carry sunlight into every corner of our barns and houses, there would never be any need to buy chemical disinfectants. The germs of consumption, dyphtheria, typhoid fever, and in fact the germs of all diseases yet discovered are killed by direct sunlight in six to eight hours. Some die after a few minutes' exposure. The germ of anthrax is killed in about two and a half hours, and even the spores are destroyed after six to eight hours. If germs are protected by blood, filth, etc., they are not killed so quickly.

Many disease germs are killed by the light which reaches them in an ordinary room but this diffused light is not nearly so powerful as direct sunlight and it usually requires several days to destroy life. However, the important lesson is taught us that well-lighted rooms do not harbor contagion. Good ventilation and light are important aids to any system of house or barn disinfection.

Heat may be employed dry, as by baking in an oven, or moist, as in boiling or steam. Dry heat is not as efficient as moist heat, and has not as much penetrating power. Boiling destroys disease germs as well as spores in from five to ten minutes. Boiling water is also very useful for floors, walls, and furniture. The addition of lye or strong soap helps its action very much.

Steam is the most efficient method of applying heat. It destroys all forms of bacteria and spores very rapidly, and has great power of penetration. Steam under pressure is still more powerful. Under a pressure of fifteen pounds steam has a temperature of about 240 degrees F, while at twenty pounds it reaches 257 degrees. These temperatures are rapidly fatal to all forms of germ life. The use of steam practically is limited on account of the special apparatus required, but where it can be obtained is one of the best means of disinfection known.

Burning of course destroys all infectious material, but the practical application of fire is limited. Bedding used in stables where animals have had contagious diseases should be raked out and burned.

— Well-Known Chemical Disinfectants. —

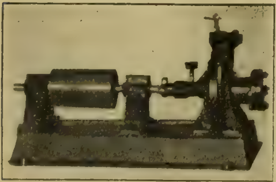
Bichloride of Mercury, commonly known as corrosive sublimate, is one of the most powerful germicides known. It has the great disadvantage of being a deadly poison to man and all animals. It must therefore be used with the greatest care not only in the house but in the barn. It dissolves in sixteen parts of cold water and three parts of boiling water. Many manufacturers make tablets of corrosive sublimate combined with chloride of ammonium, or common salt, which are easily soluble and more efficient than the drug alone. Directions are given for making a solution of any strength desired. Almost all germs which do not have spores are killed in a half hour by a solution of 1 part corrosive sublimate in 1,000 parts water. To kill spores a 1 in 500 solution must be used and one hour of time must be allowed. Putrefaction and fermentation are prevented by a 1 in 15,000 solution. Corrosive sublimate injures metal articles and plumbing, losing its germicidal power at the same time by decomposition. In case of poisoning the white of eggs and milk should be given in abundance.

Carbolic Acid is widely used and has many good qualities to recommend it. It cannot be depended upon to kill spores but it destroys all other disease germs rapidly. It does not injure any articles of clothing, nor metals. It is poisonous, however, and must be used with care. It requires twenty parts of water to dissolve one part of carbolic acid. A saturated solution is therefore close to 5 per cent., the strength in which it is usually employed. Such a solution is useful for the disinfection of sputum from consumptives or persons with pneumonia and for the discharges of typhoid fever patients. Equal portions of the solution and the material to be disinfected must be well mixed together and allowed to stand at least two hours.

The Cresols are more powerful than carbolic acid and form the basis of many disinfectants. That is known as Trikresol is sold at most drug stores, and is a very efficient germicide for all purposes. A solution of 1 in 100 in water is strong enough for general use.

Lime is one of the cheapest and most useful disinfectants that we have. It has the power of destroying organic matter as well as bacteria and is therefore very useful in the disposal of the bodies of animals which have died of contagious diseases. For disinfection it is best used as milk of lime. In preparing this quiicklime must be used. Slake by adding a pint and a half of water to each quart of lime ; or by weight, sixty parts of water to 100 parts of lime. The result of hydrate of lime—a dry powder. One quart of this is mixed with four quarts of water.

This must be freshly prepared to have any germicidal power. It may be kept two or three days if tightly corked. Air slaked lime has no value as a germicide, and water slaked lime soon loses its power if exposed to the air. This is due to the fact that it becomes changed into carbonate of lime, which has no germicidal power. Milk of lime is very valuable for disinfecting the discharges of patients with typhoid fever, dysentery or cholera. At least an equal volume of the lime must be added and well mixed with the discharge, the whole being allowed to stand two hours.



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A TRIAL SOLICITED.

The Poultry Yard.

Egg-Laying Report.

The following instructive comparison of results at the various laying competitions in S.A. appears in the official report of the last test.

	No. of hens.	Eggs laid.	Average per hen.	Eggs laid by winning pen.
1st test, Magill, 1903-4	156	20,630	132	1,032
2nd test, Roseworthy, 1904-5	186	21,704	117	1,251
3rd test, Roseworthy, 1905-6	186	31,962	171	1,343
4th test, Roseworthy, 1907-8	450	80,959	179.9	1,531
5th test, Roseworthy, 1908-9	336	63,818	190	1,447
6th test, Roseworthy, 1909-10	678	126,133	186	1,531
7th test, Roseworthy, 1910-11	534	102,723	192.3	1,513

	Market value. £ s. d.	Cost of food per hen. s. d.	Return per hen s. d.	Profit per hen. s. d.	Average price of eggs. d.
1st test	77 7 8	7 9	9 11	2 2	10.8
2nd test	58 7 4	3 4	6 3¼	3 2	7.74
3rd test	98 10 11	4 11	10 7	5 8	8.8
4th test	273 0 0	5 4½	14 10	6 5½	9.8
5th test	232 19 10	5 9¾	13 10	8 0¼	11.09
6th test	470 12 5	5 6½	13 10	8 3½	11.51
7th test	358 17 8.9	5 10½	13 5	7 6½	11.2

The steady general improvement may at first sight appear to be a matter for unmixed congratulation both to competitors and the conductor and to a certain extent it probably is so. On the other hand if we remember the actual facts, a good deal of the bloom comes off. Thus the first competition was merely a collection of casual birds of the laying powers of which their owners for the most part knew nothing and cared less. They were principally of the despised show strain, they were handled by a gentleman who, however, expert in general poultry management, had had no experience of "feeding for eggs," as the present phrase goes, assisted by a few young lads who could hardly have been expected to take much intelligent interest in what was going on.

Several of the pens were entered merely to make up the numbers and were occupied by birds picked up anywhere, whose new owners saw them for the first time at the competition. In addition the proportion of recognized laying breeds to the heavier ones was considerably smaller than it has been in recent competitions yet with these obvious disadvantages those 156 birds each laid just about one egg a week less than the 534 hens in the last test. Now boiled down one egg a week does not appear to be anything startling in the way of results after six years work in selective breeding.

The financial colums are, of course, of little real value though interesting from some points. For instance the cost of food pen hen in successive years without any knowledge of current prices (at Magill wheat went up to 7/- per bush.) is not of much use to anyone. Perhaps some enthusiast will go through the reports of past years and let us know the weight of food consumed each year, for it would be a little interesting to know how much if any more food a 1910-11 hen eats to produce her one egg a week extra. In the matter of cost of food it is noted that green food is not charged for, not that this is so important an item (of cost) as a recent correspondent to one of the dailies appeared to think. The "profit per hen" column is perhaps a little misleading and we would suggest that none of our readers run away and buy a poultry farm on the strength of that 7/6 from each of the 534 hens. There are a few trifling items of labour, rent, interest, depreciation, carriage, etc., to be taken into account. The figures really stand for the difference between food cost of production and gross value of product which is rather different to "Profit" All the same the figures leave a sufficient margin to abundantly justify the oft repeated saying that there is "Money in Poultry," and there is all the greater possibility of extracting some of it by carefully studying the good work which has been done at Roseworthy.

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Worms.

This is a fairly common complaint. Get a chemist to make up 1 part santonine, 7 parts freshly - ground areca nut (by weight). For a single bird a grain will be sufficient for a dose. In using, fast the bird or birds for twelve hours, giving only water to drink. If a number of fowls, make a dry mash of bran and pollard, sufficient say for 20 fowls, then thoroughly mix in a heaped up teaspoonful of the powder. Moisten to a crumbly mass with soup or water. Repeat in a week. The powder is also an excellent tonic for occasional use.

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S.A. Pigeon and Canary Society.

Fanciers are reminded that this Society will hold its annual show at the Trades Hall during this month.

"COMET" INCUBATORS

G. T. MILLER, Kingscote, K.I.:—"The Incubator that I had from you has given entire satisfaction, it hatched 95 per cent. of the fertile eggs.

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The Breeding Pen.

— First, as to Health, —

examine carefully each possible candidate for the honour of a place in the breeding-pen; see that the eye is clear and bright, no rheumy or frothy discharge, open the mouth, and note that it and the throat are clean and fresh-looking. Reject at once any birds if the breath smells foul, or there is sure to be trouble. See that the bird is fairly free of vermin. A healthy hen is a clean hen. Examine the legs. The scales at this time of the year should be fresh-looking and fairly pliable to the touch. If the legs are scaly, it, as in the case of other insect infestation, should not be considered an absolute bar to selection, yet I would always give the preference to a clean legged bird. In any case, it is easily cured.

Dip the legs in kerosene, and hold in for three minutes; do not let the oil touch the flesh above the joint, as this will occasion pain. It is well to oil the joints and thigh before dipping with olive oil. Three days after the dipping scrub the legs thoroughly with hot water and plenty of soap, use a hard brush, and most of the scale will disappear. Repeat the performance if necessary, and oil the legs when done. The final test as to the health or otherwise of a bird is the nature of the droppings. These should be normal in all birds in the breeding-pen—that is, fairly firm in consistency, and inclined to be dark in colour. Any looseness, frothiness, or lightness in colour, if anything but temporary, should mean disqualification.

— Signs of the Layer. —

Next we come to look for the signs of the layer. These are, I freely admit, difficult to determine, and are at best often unreliable. But we may take it that there is something at least in the often quoted "type of a layer." This usually reads as follows:—Keen and alert-looking, bright in head and comb, active in disposition, following the accepted type of dairy cow in structure, being somewhat wedge-shaped in contour of body. Free from excessive shortness of leg or extra fluffiness of feather around the stern and under-parts. By selecting such birds, one does surely get health and vigour, and as these are big factors in the make-up of a layer, and if after a little experience they turn out to be gay deceivers. well, the remedy is simple—turn them out of the breeding-pen. Nearly every owner of poultry is able to point out a few hens which are known to be good layers. These, if healthy, are the ones to breed from. I like hens, not pullets, for breeders. Age is best on the female side. Breeding this way means greater fertility, at all events in the early months of the season. It means, I believe, stronger, more virile chicks, and I have not the least doubt that it also means bigger, more saleable eggs from the pullets bred when it comes to their turn to fill the egg-basket.

I like, too, hens which have moulted early—strong, lusty birds, which have come through quickly, and now have a coat of bright, glossy feathers, which tell of health and strength.

With such birds penned in a small convenient yard, kept clean and busy not over-fed, but in good, hard condition, with the meat, green stuff, grit, and clean water, which goes to the make-up of the future chickens, success is certain.

Making Up Breeding Pens.

In the selecting of breeding stock there are a great many points to be observed. Of course, these points vary a great deal in accordance with the breeds, but there are some which apply to all, and these may be summed up in the following: All birds over two and a half years old should be culled out, as also should all those with any kind of disease, either internal or external; and the same should be done to any with defective feet, legs, or combs. The next point to be considered is how many hens or pullets should be put to each male bird. This varies greatly, according to the breed and age of the birds. With the heavy breeds, such as the Orpingtons, five or six is about the best—at any rate, not more than eight should be in a pen; but this number must be lessened in accordance with the age of the cock. For instance, a male bird of three years and over should not as a rule have more than four hens mated with him. On the other hand, with the light breeds any number of hens up to eighteen can be put with a single cock. If the birds are kept in scratching-sheds with only a limited run, there should never be more than one male bird to each house, since with two or more some disagreement is not unlikely to arise between them. In conclusion, the chief points to be remembered in making up breeding pens are: First, to be sure, that the birds are not "old stagers," and that they are perfectly healthy; second, not to put too many hens or pullets to each cock; three, to make the pen up before the fowls come into lay; and, lastly, to see that the houses, and runs are kept as clean and as fresh as possible.

Rape for Poultry.

As a succulent fresh and palatable form of green food, one on which chicks and old fowls, also, for the matter of that, thrive and do well on, rape answers the purpose most admirably. It is relished and devoured eagerly by birds of all ages, and poultrymen, who are sometimes at a loss to know just what to provide in this line, should spend a few pence, for it is cheap enough, and grow a small crop for their birds. Many who have limited space for their flocks, have often been puzzled over this question of green food. For them we would suggest the following plan, which is a method of ours, and which we think a very good one.

The difficulty in providing poultry with green food, lies in the fact that they will eat while there is green in sight, unless, of course, they have unlimited range. The aim is to provide a constant supply. Take three boards, say 12 ins. wide, by 6 ft. long, 1 in. thick, using one for the bottom, the other two for the sides. Nail together securely, and fill in the

"SARGENFRI" POULTRY YARDS.

PLYMOUTH ROCKS.

American "Ringlet" Strain. Barred to the Skin.

Winnings last year:—8 Firsts, 7 Seconds, 6 Thirds, and 2 Trophies for Best Rock in the Show.

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Our Matings this year are better than ever. As we believe the Barred Rock to be the Coming Breed for show and General Utility, we confidently recommend this line to our friends. Eggs £2 2s. and £1 1s. per doz.

Some Grand Young Stock for Sale.

BLACK ORPINGTONS.

In Black Orpingtons we can offer Eggs from our best pens, in which our noted winning "Sargenfri" King "Sargenfri" Prince blood is well represented, at usual prices, £2 2s. £1 1s. and 10s. 6d. per dozen.
High-Class Young Stock.

WHITE LEGHORNS.

We have 400 well-bred young Leghorns ready for Customers. They are birds of good quality, and will turn into healthy, vigorous, heavy-laying stock. (N.B.—"Sargenfri" Leghorns lay standard size eggs every time. Eggs from all Pens 10s. 6d. per dozen.

INDIAN RUNNER DUCKS.

Unbeaten in the Show Ring and Splendid Layers. A Fine lot of Typical Young Stock for Sale. Eggs 10s. 6d. per dozen.

C. J. CHANDLER (Near Glynde Hotel) East Payneham.

ends with pieces 11 in. x 12 in., then fill up with good earth to a depth of six inches, sow your seed, after which the top should be covered with fine wire netting. Through this the birds will be able to just keep the tops of the juicy plants nibbled off, and the supply of green food will last a long time. Small chicks of course will not be able to get at the rape in a box of this kind, but the rape can in that case be fed to them and of course will grow much quicker. When different broods of chicks are kept in separate runs (as they should be) one of these boxes placed halfway between the two runs would provide not all they would eat, but enough for them to get along with, more would be desirable.

For old birds, rape is a fine food, it can be sown broadcast and allowed to attain full height, before the fowls are permitted to feed in it, and then every other day is all it will stand, unless of course the patch is very extensive. The small fancier is then advised to grow box patches of rape, or larger patches if he can, the larger breeder is reminded of its value. Try, and see for yourself, as others have done.—E. F. in "Poultry."

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Some Hens.

No two hens on earth are exactly alike in all respects. This is due to a fixed law of nature. Nature never makes exact duplicates of anything.

Some hens never lay during their moult—other hens lay well throughout the entire period, and keep in full health and vigor. Housing, feeding and care should be the same in both cases.

Some hens habitually lay "a litter of eggs" and then "go broody," or cease laying for a time, repeating the operation several times during the year; other hens (regardless of breed) lay right along, never skipping more than a few days at a time, for ten, twelve or more months "on a stretch."

Some hens produce nearly 100 per cent. of fertile eggs, while other hens in the same flock rarely or never lay a fertile egg. In many cases, the number of eggs produced by each hen seems to have no bearing whatever on the matter of fertility.

Some hens persist in laying thin shelled and non-shelled eggs, although supplied with plenty of oyster shell, grit and bone; other hens lay perfect shelled eggs although deprived of those materials for a long time.

Some hens continue to lay right through the coldest winter weather in cold houses and without careful feeding and care; other hens never lay in winter unless more warmly housed and skilfully "fed for eggs."

Some hens gradually reduce the size of their eggs at they approach the end of a "laying period"; other hens lay full size eggs to the last.

Some hens that produce dark or medium brown eggs when beginning to lay gradually exhaust their supply of coloring material and their eggs grow lighter and lighter as laying continues; other brown egg hens keep up the standard of color to the end.

Some hens produce pullets that resemble their dams in appearance and performance; other hens do not.

Some hens always cackle after laying; other hens do so seldom or never. Some hens cackle much and lay little; resembling the barking dog that never bites. Incidentally, let me remark, many barking dogs do bite.

Some hens want a drink of water as soon as they quit the nest after laying; other hens seldom drink at that time.

Some hens produce 200 or more eggs in one year or less under conditions of housing, feeding and care that are apparently far less favorable to that end than those that obtain where other hens produce half as many or less.

Some hens produce eggs that are very similar to each other—so much so that one may readily learn to identify the layer by the individuality of her egg; other hens produce eggs that vary more or less in size, shape and general appearance.

As one facetious farmer said: "There is just as much difference in hens as there is in people, and sometimes more."

There are, of course, certain general characteristics which are possessed in common by all hens, and others which typify the different breeds and varieties, but each bird has a distinct individuality, and no flock may be depended upon to respond uniformly to any one set rule of feeding and care. Neither is anyone justified in the narrow conclusion that the habits, temperaments and performances of such birds as he has known are necessarily typical in all respects of the hens of other people.

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The Value of Eggs.

There is no better way of helping along the poultry industry than by making known the value of eggs.

There is no better way of knowing the value of eggs than by reading the following article.

There is no better way of showing one's appreciation of that article than by using eggs in the home and calling for them at one's hotel, and like the little boy, refusing to be happy till one gets them.

The good wife or the less good landlady may be inclined to hint that eggs at 1/6 per doz. are not to be lightly spoken of. Never mind just keep on calling, and great shall be your reward.

There is an apple society in America of which every member is pledged to eat a certain number of apples a day or in default show cause per doctor's certificate. This, so we have read, has been the cause of an extraordinary increase in the demand for this homely fruit, an increase which we remember thinking to be quite worthy of the land of magnificent imaginations.

How about an egg eating society in South Australia?

CYPHER'S INCUBATORS.

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SOLE AGENTS.
SHOPPING CENTRE, RUNDLE-STREET AND STEPHENS-PLACE.

Terms Used by Poultrry People.

Barred, Barring, — Alternate stripes of light and dark across a feather.

Beard.—A bunch of feathers under the throat of some breeds, as Houdans or Polish.

Breast.—In a live fowl, the front of the body above the point breastbone, up to the throat. In a table fowl (dead) the breast is below this, and would be called the under part of the body in the live fowl.

Breed.—Any variety of fowl in its distinct characteristics. The breed includes all the varieties of colour which are found in it.

Brood.—The family of chickens under one hen or brooder.

Broody.—Desiring to sit or incubate.

Cape.—The feathers under base of the back hackles, between the shoulders.

Carriage.—The bearing, attitude, or "style" of a bird.

Caruncles.—Fleshy protuberances, as on the neck of a turky cock.

Chicken.—This word is often applied to any age indefinitely until twelve months old.

Cockerel.—A young cock.

Comb.—The red protuberance on the top of a fowl's head.

Condition.—The state of the fowl as regards health and beauty of plumage—the latter especially.

Crest.—A crown or tuft of feathers on the head. The same as top-knot.

Crop.—The bag or receptacle in which food is stored before digestion. Can be easily felt in any fowl after feeding.

Cushion.—The mass of feathers over the tail-end of a hen's back, covering the tail; chiefly developed in Cochins.

Deaf-ears.—Same as Ear-lobes.

Ear-lobes.—The folds of skin hanging below the ears. They vary in colour in different breeds, between red, white, blue, and cream, and also greatly in size.

Face.—The bare skin round the eye.

Flights.—The primary feathers of the wing, used in flying, but tucked under the wing out of sight when at rest.

Fluff. — Soft down feathers about the thighs, chiefly developed in Asiatics; also the downy part of the feather.

Furnished.—Assumed the full characters. When a cockerel has obtained his full tail, comb, hackles, etc., as if adult, he is said to be "furnished."

Gills.—This term is often applied to the wattles, and sometimes more indefinitely to the whole region of the throat.

Hackles.—The peculiar narrow feathers on the neck of fowls, also found in the saddle of the cock. In the latter case they are called "saddle" hackles or feathers; hackles alone always referring to the neck-feathers.

Hen-feathered, or Henny. — Resembling a hen in the absence of sickles or hackle-feathers, and in plumage generally.

Hock.—The joint between the thigh and the shank.

Keel.—The vertical part of the breast-bone. Also applied to dependent flesh and skin below the latter, as in many ducks.

Kkock-kneed.—The hocks standing near together, instead of well apart.

Laced, lacing.—A stripe or edging all round a feather, of some colour different from its ground-colour, as in Sebrights and Wyandottes.

Leg.—In a live fowl this is the scaly part, or shank. In a bird dressed for table, on the contrary, the term refers, as is well known, to the joints above.

Pencilling.—Small markings or stripes over a feather. These may run either straight across, as in Hamburgs, or in a cescentic form, as in Partridge Cochins.

Leg-feathers.—The feathers projecting from the outer side of the shanks in some breeds, as Cochins.

Mossy.—Confused or indistinct in marking.

Pea-comb.—A triple comb, resembling three small combs in one, the middle being the highest.

Poult.—A young turkey.

Primaries.—The flight-feathers of the wings, hidden when the wing is closed, being tucked under the visible wing composed of the "secondary" feathers. Usually the primaries contain the deepest colour all over the body, except the tail, and great importance is attached to their colour by breeders.

Pullet.—A young hen.

Rooster.—An American term for a cock.

Rose-comb.—A broad solid comb, the top of which is nearly level and covered with small points. It becomes broader as it recedes from the front, ending with a spike or "leader" at the back.

Saddle.—The posterior part of the back, reaching to the tail, in a cock, answering to the cushion in a hen.

Secondaries. — The quill-feathers of the wing which are visible when the bird is at rest.

Self-colour.—A uniform tint over the feather or the bird.

Shaft.—The stem or quill of a feather.

Shank.—The scaly part of the leg.

Sickles.—The top curved feathers of a cock's tail. Properly only applied to the top pair, but sometimes used for one or two pairs below which can hardly be called tail-coverts.

Spangling.—The marking produced by each feather having one large spot or splash of some colour different from its ground-colour. When applied to a laced breed, as

Burford's "Magic" Egg Preserver.

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THOUSANDS OF POUNDS WORTH OF EGGS

Preserved with

BURFORD'S "Magic" Egg Preserver.

in Polish, the word is explained by the much broader lacing at the tip of each feather.

Diamond.—A term sometimes applied by Game breeders to the wing-bay.

Dubbing.—Cutting off the comb, wattles, etc., so as to leave the head smooth and clean.

Spur. — The sharp offensive weapon near the heel of a cock or hen.

Squirrel-tailed.—The tail projecting in front of a perpendicular line, over the back.

Stag.—Another term for a young cock, chiefly used by game breeders.

Station.—Another term for symmetry, but rather markedly in connection with height and reach.

Strain.—A race of fowls which, having been carefully bred by one breeder or his successor for years, has acquired an individual character of its own which can be more or less relied upon.

Surface-colour.—That portion of the feathers exposed to view. See under-colour.

Symmetry.—Perfection of proportion.

Tail-coverts.—The soft, glossy, curved feathers at the sides of the bottom of the tail. Usually the same colour as the sickles.

Tail-feathers.—The straight and stiff feathers of the tail only. The top pair are sometimes slightly curved, but they are always nearly if not quite straight, and are contained inside the sickles and tail-coverts.

Thighs. — The joint above the shanks; the first joint clothed all over with feathers. The same as the drumstick in dressed fowls.

Top-knot.—Same as crest.

Tri-coloured.—A term often applied to cockerels which should be of one uniform colour, when their hackles and saddles and tails are much darker, and the wing-bow darker still. Chiefly in buff varieties.

Trio.—A cock or cockerel, and two hens or pullets.

Under-colour.—That portion of the feathers under the surface only seen when the plumage is opened or separated. That of the fluff of the feather. It often differs greatly from the surface-colour, and is of great importance in breeding.

Variety.—Some definite division of a breed known by its colour or marking. Thus the breed includes all the varieties.

Vulture-hock. — Stiff projecting quill-feathers at the hock-joint. The feathers must be both stiff and projecting to be thus truly called and condemned.

Wattles. — The red depending structures at each side of the base of the beak. Chiefly developed in the male sex.

Web.—This term is indefinite, expressing a flat and thing structure. The web of a feather is the flat or plume portion; the web of the foot, the flat skin between the toes; of the wing, the triangular skin seen when the member is extended.

Wing-bar. — Any line of dark colour across the middle of the wing, caused by the colour or marking of the feathers known as the lower wing-coverts.

Wing-bay.—The triangular part of the folded wing between the wing-bar and the point.

Wing-bow.—The upper or shoulder part of the wing.

Wing-butts.—The corners or ends of the wing. The upper ends are more properly called the shoulder-butts, and are thus termed by Game fanciers. The lower, similarly, are often called the lower-butts.

Wing-coverts.—The broad feathers covering the roots of the secondary quills.

After a Long Journey.

As soon as the fowl, or fowls, are taken out of the coop in which they have travelled, put them into either a large coop or an outhouse. Let them have water first; on no account give any feed until they have partaken of water. If they have been without it, and they appear extraordinarily thirsty, squeeze a small quantity of lemon juice into their water, or put in a small quantity of Epsom salts, enough to give it a slight bitter taste. After they have in a good measure satisfied their thirst, give them a very moderate feed of maize. On no account give them any soft food if they are thirsty or very hungry, or what is worse still, wheat, except it has been boiled. A bird is often permanently injured by getting an over-distended crop, through having been given a feed of wheat or soft food and then allowed to drink. A dose of a teaspoonful, or rather over, of Epsom salts should always be administered to each fowl within twenty-four hours after arrival at destination, unless it has been put in water as advised above, when the dose can be deferred for another twenty-four hours with advantage.

Good Business.

Mr. Chandler, of the Sargenfri Poultry Yards, writes:—"Business has been very good all along, and in Plymouths it has passed my expectations. People are very keen on them everywhere. I am sending them to all the States. Next week I am shipping two pens to W.A., this week I am sending a show trio to N.Z. to be shown at all shows there, so the buyer tells me, and dozens of other places I have sent them, and still the orders come, so I think this is a favourable indication as to them coming to stay. I have also orders for White Leghorns for competition breeders and best quality Orpingtons for N.Z. also Orpingtons and White Leghorns for W.A., so I don't think I can complain. My Leghorn stock has been cut into very heavily. You will perhaps be interested to know that I purchased what several good judges deemed to be the best Black Orpington pullet in the Sydney show, although she did not get first prize, being not quite full in feather. Her breeder, who scooped pretty heavily in the Orpington classes, refused £12 12/- for her, and was very unwilling to part with her, for he too believed her better than his first prize pullet."

Broken Hill Show.

Mr. Grosser has promised a full report of the pigeons at the above show for next issue.

WANTED TO SELL.

DORKINGS.—Silver and Coloured and Indian Game low set up-to-date strain. Columbian Wyandottes. Eggs 10/- for 15. Birds from 10/6 each, according to quality. — J. J. GABB, Somerton Prize Poultry Yards, Glenelg, S.A. 8-11.

INCUBATORS AND BROODERS, Simplex, awarded first price (silver medal) Adelaide Exhibition, 1910. Agent for Cort's Patent Cooler-safe, a boon in summer. Send for price list.—D. LANYON, Manufacturer, 46 North Terrace, Kent Town. 6-11.

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15 Eggs to each setting. Guaranteed fertile or replaced. 10/6 per setting.

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Eggs and Their Food Value.

By Prof. J. F. Snell, Macdonald College.

> "Treasure houses wherein lie,
> Locked by angels' alchemy,
> Milk and hair and blood and bone."

These lines from Charles Kingsley's "Poetry of a Root Crop," have been even more aptly applied to eggs by Dr. Robert Hutchison in his "Food and the Principles of Dietetics." Their most obvious application lies in the relation of the egg to the chick hatched from it, for, enclosed within the shell, is not merely the germ with its marvellous power of development into a new individual of its species, but also a store of food, suited to the requirements of infant life, and sufficient to provide the chick with the "hair and blood and bone" with which it emerges, fully-armed, into the outer world. Indeed, to the great majority of feathered infants (the pigeon being one well-known exception) the contents of this storehouse are the only milk that nature provides. The inference is an obvious one, that, containing, as they do, ingredients naturally adapted to the earliest stages of animal life, eggs should constitute an appropriate article of food for children, and we shall see that chemistry lends its support to this inference, though it likewise confirms the observation of experience that bad cooking (which, in the case of eggs, is usually overcooking) may materially alter the condition of the food, and render it so difficult of digestion as to be utterly unsuited for the use of the young.

Like all succulent foods, eggs contain a large proportion of water. The quantity amounts to about seventy-four per cent. of the total weight of the contents of the shell, not including the shell itself, which is, of course, much drier. Thus water constitutes very nearly three-fourths of the contents of the egg, the proportion of water being almost exactly the same as in the flesh of a broiler, but considerably greater than that in the flesh of a full-grown hen. The water of the egg is unequally distributed between the white and the yolk, the former being seven-eighths accurately (85.7 per cent.), the latter only about one-half water (50.9 per cent.) From this standpoint, then, the yolk of the egg is a much richer food than the white—just as solid meat is richer food than soup. To get the same weight of solid food from white of egg as from one pound of yolks, we should have to take one and three-quarters pounds of white. We shall see later that there is another sense in which the yolk of the egg is to be regarded as a richer food than the white. Our present point is merely that, weight for weight, it is a more concentrated, a less, watery food than the white.

But although the yolk is the more concentrated portion of the egg, it is the smaller of the two in size and weight. I wonder how many egg-eaters have ever stopped to compare the relative quantities of the two divisions of the egg. Doubtless most of us know that the white is the larger, but how many have any idea how much larger? As a matter of fact, the white is, on the average. nearly twice the weight of the yolk. In other words, roughly, one-third of the edible weight of the eggs is yolk, and two-thirds white. More exactly, the average figures are: shell, about 12 per cent. of the whole egg; white, about 58 per cent. of the whole egg; yolk, about 30 per cent. of the whole egg; or, of the edible portion the white constitutes 66 per cent., and the yolk 39 per cent.

Taking these figures in conjunction with the respective proportions of water in white and yolk, we see that, of the total solids of the egg, about one-third is contained in the white and two-thirds in the yolk; for the yolk forms one-third of the contents of the egg, and about one-half of the yolk is solid matter, so the solid matter of the yolk constitutes (one-half of one-third equals) one-sixth of the total weight of the egg contents. And, of the white, which constitutes two-thirds of the total weight, only one-eighth is solid matter; accordingly, the solid matter of the white comprises (one-eight of two-third equals) one-twelfth of the total contents. The yolk solids, therefore, weigh twice as much as the white solids; or the yolk contains two-thirds, and the white one-third, of the solid matter of the egg, exclusive of the shell.

If the solids of the yolk and white were identical in composition, then the food value of the yolk of an average egg would be about twice that of the white. But the solid matter of the two is by no means identical, and, to explain the difference, it will be necessary to define some chemical terms.

If we were to remove all the water from an egg, or from a chicken, o a piece of meat, we should fin that the remaining substances — constituting the "dry-matter" or "total solids" — could be divided into two classes, those which will burn and those which will not, The former constitute the organic substances of the egg or meat, the latter the inorganic substances or "mineral matter." When the dried egg or meat is burned, the mineral matter is left behind as an ash, while the organic matter disappears (being converted into gases, which pass off into the air). But if, instead of burning out the organic matter, we were to extract the dried substance with ether or with gasoline, we should find that a part goes into solution, while the remainder remains undissolved. The part which dissolves in the ether or gasoline is the fat. Fat is one sort of organic matter. The undissolved residue contains the mineral matter (ash), but also a quantity of organic matter, more abundant than the ash, and quite different in composition and properties from the fat. In the case of the pieces of meat, the organic matter left undissolved by the ether is the bran of the meat, the muscular fiber of the animal. It consists of what we call protein or nitrogenous organic matter. Fat contains carbon, hydrogen and oxygen, but no nitrogen. Protein is about one-sixth nitrogen, the remainder being mostly carbon, hydrogen and oxygen.

Food has two functions: First, the replacement of worn-out cellular tissue; second, the production of heat and muscular work. For the purpose of the second of these functions, the supplying of heat to keep the body warm and of energy to enable it to work, fat is the most concentrated, the richest, of our foods. One pound of fat supplies nearly two and a half times as much energy (in the form of heat or work) as one pound of protein or one pound of sugar or starch. On the other hand, protein alone can build up new muscular tissue in the growing child, or replace the used-up tissues of the body of either child or adult. Protein is thus the most essential, the most indispensable food. It must form a part of every diet. One could not live on fat alone, nor on sugar or starchy foods. Fat pork requires, as accompaniment, either some lean, or a vegetable rich in protein, such as beans or peas. Even fat pork and potatoes would not form a satisfactory diet, since neither contains more than a very little of the indispensable nutrient, protein.

The organic matter of the egg consists of these two important nu-

TICK

South Australian poultry owners have found that the very best remedy for the TICK CURSE is

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Periodically dip the infested birds and spray infested houses and runs with Faulding's Phenytas and there will be no further fear of tick.

FAULDING'S PHENYTAS is Absolute DEATH TO THE TICK

trients (protein and fat), but the relative quantities of the two are very different in white and yolk. The organic matter of the white is practically all protein (albumen), with the exception of a very minute quantity. The yolk, on the other hand, has twice as much fat as protein. If we leave the water out of consideration, we find the proportion of the dry matter in white and yolk to be as follows :—

	Protein	Fat.	Ash.
White	94	2	4 per cent.
Yolk	33	65	2 per cent.

Remembering that the yolk contains twice as great a weight of total solids as the white, we get a better idea of the relative quantities of each class of solids in the two divisions of the egg by multiplying the second line of the above table by two. On doing so, we find that the white and yolk of an egg have about equal quantities of ash (the yolk actually somewhat the larger quantity. See below), and that the yolk has two-thirds as much protein and sixty five times as much fat as the white. We can compare the energy-producing powers of the two by multiplying the fat in each case by 2½ (more accurately, 2.4) and adding the protein. Doing so, we find that the yolk has nearly four times the value of the white. From this very important standpoint, then, nearly four-fifths of the nutritive value of the egg is concentrated in the little yolk. In energy-producing value, or "fuel value" (as it is often termed) egg yolk is about the equal, weight for weight, of wheat flour, roast beef, or medium fat mutton; while the white is hardly equal to a poor milk. The egg, as a whole, is about equal in fuel value to its own weight of very lean beef.

When we leave out of consideration the shell, which, with the exception of about four per cent. of binding material—similar to that in hoofs and horns—is entirely made up of mineral matter of the same composition as limestone, the mineral matter of the egg, like that of other foods, comprises only a small proportion of the total weight. The ash of the white amounts to only about 4½ per cent., and that of the yolk to only 3 per cent., of the total dry matter. But as the total dry substance of the yolk is, as we have seen, nearly twice that of the white, the yolk actually yields a somewhat larger quantity of ash than the white. What is more remarkable and more significant is that the ashes of the two divisions of the egg are entirely different in composition. Those of the white are alkaline, those of the yolk are acid. The ash of the white consists chiefly of common salt, and the allied substance, potassium chloride. The yolk ash, on the other hand, is rich in lime and exceedingly rich in phosphoric acid.

Phosphates of lime being the chief constituent of bone, egg-yolk is a food peculiarly adapted to the formation of bone, and therefore an appropriate food for growing children. Excepting milk (which has over twice as much) no other food contains as large a proportion of lime in its ash.

In respect to phosphoric acid egg-yolk stands at the head of the list, the proportion of this valuable mineral ingredient being more than twice as great in the ash of yolk as in that of milk. Egg-yolk contains, also, a notably large percentage of iron, and the iron is present in a form in which it is readily absorbed and utilized for the enrichment of the blood. Hence, eggs are good food for anaemic persons. Regarding their value as food for children, we cannot do better than quote Hutchison's words: "The great richness of yoke of egg in fat, in lime salts, and in organic compounds of phosphorus and iron, makes it a peculiarly valuable food for young infants, especially those who are suffering from rickets, for it is just those very compounds which a child needs, and a rickety child needs them most or all." (Hutchison "Food and Dietetics.")

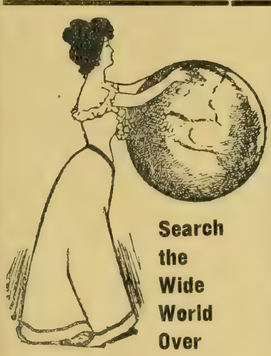
Though rich in protein, and fat, eggs, like meat, do not contain any of the other great class of organic food substances, viz., carbohydrates, but the protein and fat are present in eggs in a condition in which they are readily combined with food materials rich in carbohydrates, so as to form a properly-balanced retion. Among the food materials rich in carbohydrates are flour and other cereal products, rice, sago, tapioca, corn. starch, etc.

Both yolk and white flow readily and are easily mixed into the batter of cake or pudding. Moreover, the white has the valuable property of being readily beaten into a froth to render cakes light or to form soft icings. This adaptability to a variety of treatments is one of the characteristics which render eggs so acceptable to the cook, who produces many delicious dishes owing their protein and fat largely to the eggs contained in them, but supplementing this protein and fat with such carbohydrates as sugar and the starch of flour, rice, sago, etc.—From "The Farmer's Advocate." (Revised).

◆

Hint for Cold Mornings.

When the mornings are chilly, the hens and young birds should have something to scratch at directly they come out of the house, such as short straw, leaves, and horse manure. A few grains of wheat should be buried or covered up, and then they will begin to scratch directly they are out, and they do not feel the cold because of the scratching exercise.



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High class stock and eggs in season satisfaction guaranteed.
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T. B. BROOKS - - Clarendon.

Pigeons and Canaries.

Sydney Royal Show, 1911.

(Pigeon Section).

By J. Noble.

The Royal of 1911 has passed. To many of our leading exhibitors throughout the Commonwealth, this is their "Palace" Show, and to win at this great event, is the one desire of all who exhibit, but of course, all cannot be prize winners, consequently many birds are cardless, and this is where the grumbler comes in (was there ever a show without them ?), fanciers who cannot see the faults of their own birds, "whose geese in their idea are swans." This is coupled with another evil, some of the old time fanciers, who have done their share of judging in the past, make it a practice, to follow Sydney shows, their object being, to sow seeds of discord and mischief, among any defeated exhibitors, who are ready to listen to adverse criticism while smarting under their defeat. Apart from this, the entry was a considerable increase on that of last year, and there was a decided improvement, in the quality of some, of the exhibits. We are pleased to congratulate fanciers from Queensland, Victoria, and South Australia, who competed and carried off premier awards.

Fanciers competing at this classical fixture are under the disadvantage of having each section of feathers divided. Poultry in one pavilion. Pigeons, ducks, etc., in another. Canaries and cage birds in yet another. Rumour has it, that next year we will probably have "all feathers" under one huge roof, which will probably be one of the finest pavilions in the world, for such a section. Mr. W. H. Smith, of Redfern, judged all Tumblers, Mr. J. Stonestreet, Australian Dragoons, and Mr. J. Noble all other classes.

Pouters.—Little competition, D. Hutton, securing all firsts, with birds of very high quality.

Carriers.—J. A. Markham the only exhibitor.

Barbs.—Again Mr. Markham the only competitor.

Dragoons. — Mr. Markham penned some good birds, taking Championship with a rather good blue cock.

Dragoons Australian. — As usual, heavy competition which is regrettable. considering they are a variety extinct elsewhere.

Fantails.—Provided three classes, the whites produced some grand birds, the First and Champion, a hen, being the best I have seen for some years.

Jacobins.—Three exhibits, medium quality.

Owls English.—Fair competition. The Champion Blue Cock, rather typical, appeared in name of F. F. Freeland.

Owl Africans.—Six classes, only fair competition, quality of some very good. The First and Champion, a white hen in name of A. T. Bolton, also a black tail white cock, in name of H. Pembroke, and the cock first in young birds in name of E. A. Grosser, these three stood out from the others, as real "toppers."

Show Homers. — Poor competition, although each bird will take beating. Tumblers, Longfaced. Provided quite a number of classes, in which the competition was rather good, the bulk of awards going to W. R. Turner and H. E. Peir.

Tumblers, Shortfaces.—Four classes of medium quality.

Magpies.—Poor competition, and the winners were badly shown.

Turbits.—A. T. Bolton secured the Champion Card with a nice black cock.

Oriental Frills. — The Championship was secured by a rather nice Blondinette exhibited by E. A. Grosser.

Nuns, one class.—First and second cards going to S. Ellis. Flying Homers rather good competition, the Championship card going to Val Heaton won by a lovely blue hen.

Any Other Variety Classes. — The First in cocks went to a typical Pigmy Pouter in name of F. Crotty. In the hens, the winner being a grand specimen of a Russian Trumpeter, in name of H. Pembroke.

— Prize List. —

The following is a full list of the awards. The figures preceding class name indicate number of entries :—

3.—Carrier, any color, cock or hen : John A. Markham, 1, 2, and 3.

3.—Barb, any color, cock or hen : John A. Markham, 1, 2, and 3.

4.—Dragoon, London, blue, cock : John A. Markham, 1, and champion, and 3 ; F. Murphy, 2.

2.—Dragoon, London, blue, hen : J. A. Markham, 1, and 2.

3.—Dragoon, London, any other color, cock : John A. Markham, 1 and 2 ; J. M'Grath, 3.

3.—Dragoon, London, any other color, hen : John A. Markham, 1 and 2 ; J. M'Grath, 3.

13.—Fantail, white, cock or hen : Burton C. Charles, 1 and champion, and 3 ; H. Pembroke, 2 ; David J. Davies, v.h.c. ; George Woodward, v.h.c. ; F. Crotty, h.c.

5.—Fantail, black, cock or hen : W. H. Walker, 1 ; F. Crotty, 2 ; Samuel Ellis, 3.

5.—Fantail, any other color, cock or hen : David J. Davies, 1 and 3 ; W. H. Walker, 2.

4.—Jacobin, any color, cock or hen : George Woodward, 1 ; A. C. Davies, 2.

7.—Owl, English, blue or blue powdered, cock or hen ; F. F. Freeland, 1 and champion ; John A. Markham, 2 and 3.

6.—Owl, English, any other, color, cock or hen : William C. Forster, 1 ; Samuel Ellis, 2 ; B. J. Stockwell, 3 ; John A. Markham, v.h.c. ; F. F. Freeland, h.c.

3.—Owl, English, any color, cock or hen (young birds) : Samuel Ellis, 1 ; B. J. Stockwell, 2 ; F. F. Freeland, 3.

4.—Owl African, white, cock : A. T. Bolton, jun., 1 ; William C. Forster, 2 ; Clyde House, 3.

5.—Owl, African, white, hen ; A. T. Bolton, jun., 1 and champion ; Hinton Coles, 2 ; William C. Forster, 3.

6.—Owl, African, any other color, cock : H. Pembroke, 1 ; E. A. Grosser, 2 ; A. T. Bolton, jun., 2 ; A. C. Davies v.h.c. ; H. T. Adams, h.c.

3.—Owl, African, any other color, hen : A. T. Bolton, jun., 1 ; A. C. Davies, 2 ; B. J. Stockwell, 3.

3.—Owl, African, any color, cock (young birds) : E. A. Grosser, 1 ; A. T. Bolton, jun., 2 ; Hinton Coles, 3.

4.—Owl, African, any color, hen (young birds) : E. A. Grosser, 1 ; A. T. Bolton, jun., 2 ; A. C. Davies, 3.

2.—Show Homer, blue chequered or black chequered, cock : H. Pembroke, 1 ; Samuel Ellis, 2.

7.—Tumbler, long-faced, beard, black, cock : W. H. Walker, 1 and 2 ; Harold E. Peir, 3.

4.—Tumbler, long-faced, beard, black, hen ; W. Ridpath Turner, 1 and 2 ; Harold E. Peir, 3.

3.—Tumbler, long-faced, beard, any other color, cock : W. Ridpath Turner, 1, 2, and 3.

4.—Tumbler, long-faced, beard, any other color, hen : W. Ridpath Turner, 1 and 2 ; Samuel Ellis, 3 ; Hinton Coles, v.h.c.

6.—Tumber, long-faced, baldhead, black, cock : Harold E. Peir, 1 ; W. Ridpath Turner, 2 ; Samuel Ellis, 3.

4.—Tumbler, long-faced, baldhead, black, hen ; Harold E. Peir, 1 and 3 ; W. Ridpath Turner, 2 and v.h.c.

3.—Tumbler, long-faced, baldhead, red or yellow, cock : Samuel Ellis, 1 ; Harold E. Peir, 2 and 3.

3.—Tumbler, long-faced, baldhead, red or yellow, hen : Harold E. Peir, 1 and 2 ; Samuel Ellis, 3.

2.—Tumbler, long - faced, black mottle, rose.wing or white-side, cock : Harold E. Peir, 1 and 2.

2.—Tumbler, long.faced, black mottle, rose-wing or white-side, hen : Harold E. Peir, 1 and 2.

5.—Tumbler, long-faced, red mottle, rose-wing or white-side, cock or hen : W. Ridpath Turner, 1, 2, and 3.

1.—Pouter, blue-pied, cock : Daniel Hutton, 1 and champion ; H. Pembroke, 2 ; John A. Markham, 3.

4.—Pouter, blue-pied, hen : Daniel Hutton, 1 and 2 ; H. Pembroke, 3.

3.—Pouter, any other color, cock or hen : Daniel Hutton, 1 and 2 ; B. J. Stockwell, 3.

14.—Dragoon, Australian, silver, cock or hen : Samuel Ellis, 1 ; Walter Turner, 2 ; Hinton Coles, 3.

8.—Dragoon, Australian, blue, hen: Walter Turner, 1 and 2; R. Haines, 3.

9.—Dragoon, Australian, white, cock: Hinton Coles, 1; R. L. Biddell, 2; H. Byrnes, 3.

7.—Dragoon, Australian, white hen: Val. Heaton, jun., 1 and champion; Samuel Ellis, 2; Robert Comley, 3.

5.—Dragoon, Australian, chequered, cock: Cecil M'Donagh, 1; W. L. White 2; Ritchie Campbell, 3.

5.—Dragoon, Australian, chequered, hen: Geo. B. Thomas, 1; Ritchie Campbell, 2; Hinton Coles, 3.

6.—Dragoon, Australian, any other color, cock: W. L. White, 1; Cecil M'Donagh, 2; H. J. Challis, 3.

5.—Dragoon, Australian, any other color, hen: John A. Markham, 1; H. J. Challis, 2; H. Byrnes, 3.

1.—Dragoon, Australian, any color, cock (young birds): Robert Comley, 1; Ritchie Campbell, 2; H. J. Challis, 3.

7.—Dragoon, Australian, any color, hen (young birds): R. Haines, 1; J. D. Wheeler, 2; Samuel Ellis, 3.

1.—Show Homer, blue chequered or black chequered, hen: Samuel Ellis, 1.

1.—Show Homer, any other color, hen: Samuel Ellis, 1.

1.—Show Homer, any other color, cock: Samuel Ellis, 1 and champion.

6.—Tumbler, long-faced, baldhead, any other color, cock or hen: Harold E. Peir, 1, 2, and 3.

8.—Tumbler, long-faced, yellow mottle, rose-wing or white-side, cock or hen: W. Ridpath Turner, 1 and 3; Hinton Coles, 2.

8.—Tumbler, long-faced, black, cock: W. Ridpath Turner, 1 and 2; Harold E. Peir, 3.

6.—Tumbler, long-faced black, hen: James Gibson, 1; W. Ridpath Turner, 2 and 3.

10.—Tumbler, long-faced, red, cock: W. Ridpath turner, 1 and 3; James Helson, 2.

5.—Tumbler, long-faced, red, hen: R. Ridpath Turner, 1; James Helson, 2.

8.—Tumbler, long-faced, yellow, cock: W. Ridpath Turner 1 and 3; James Helson, 2.

5.—Tumbler, long-faced, yellow, hen: R. Haines, 1; W. Ridpath Turner, 2; James Helson, 3.

6.—Tumbler, long-faced, any other color, cock or hen: W. Ridpath Turner 1; Hinton Coles, 2; Harold E. Peir, 3.

6.—Tumbler, muff-legged, saddleback or badge, cock: Harold E. Peir, 1 and 2; W. H. Walker 3.

6.—Tumbler, muff-legged, saddleback or badge, hen: Harold E. Peir, 1 and 3; Samuel Ellis, 2.

9.—Tumbler, muff-legged, black, cock: W. H. Walker, 1 and champion; W. Ridpath Turner 2, R. Haines, 3.

9.—Tumbler, muff-legged, black, hen: Samuel Ellis 1 and 2; R. Haines, 3.

9.—Tumbler, muff-legged, blue, cock or hen: W. H. Walker, 1 and 2; R. Haines, 3.

6.—Tumbler, muff-legged, silver, cook or hen: Samuel Ellis, 1; W. H. Walker, 2.

3.—Tumbler, muff-legged, red, cock or hen: James Helson, 1 and 2; W. H. Walker, 3.

7.—Tumbler, muff-legged, yellow, cock or hen: James Helson, 1 and 2; Hinton Coles, 3.

7.—Tumbler, muff-legged, any other color, cack: Samuel Ellis 1, Hinton Coles, 2; W. Ridpath Turner, 3.

6.—Tumbler, muff-legged, any other color, hen: W. Ridpath Turner, 1; Haeold E. Peir, 2; W. H. Walker, 3.

3.—Tumbler, short-faced, beard or bald-head, any color, cock or hen: Samuel Ellis, 1; F. Murphy, 2 and 3.

3.—Tumble, short-faced, almond, cock or hen: E. A. Grosser, 1 and champion, F. Murphy, 2 and 3.

5.—Tumbler, short-faced kite, or whole coloted, cock or hen: W. H. Walker, 1; E. A. Grosser, 2; F. Murphy, 3.

5.—Tumbler, short-faced, any other color, cock or hen: F. Murphy, 1; Samuel Ellis, 2; W. H. Walker, 3.

3.—Beard, London, or German, any color, cock or hen: F. Murphy, 1; Samuel Ellis, 2; F. Murphy, 3.

3.—Magpie, black, cock: W. H. Walker, 1; Hinton Coles, 2; Geo. Woodward, 3.

4.—Magpie, black, hen: Samuel Ellis 1 and champion; Hinton Coles, 2; Geo. Woodward, 3.

2.—Magpie, red or yellow, cock or hen: Hinton Coles, 1; Geo. Woodward, 2.

3.—Magpie, any other color, cock or hen: Hinton Coles, 1; Samuel Ellis, 2; Geo. Woodward, 3.

3.—Turbit, any color, cock: T. T. Bolton, jun., 1 and champion; H. Pembroke, 2; F. Murphy, 3.

2.—Turbit, any color, hen: A. T. Bolton, jun., 1; F. Murphy, 2.

4.—Blondinette, black-laced, cock or hen: E. A. Grosser, 1 and champion and 2; F. Murphy, 3.

4.—Blondinette, any other color laced, cock or hen: E. A. Grosser, ; F. Murphy, 2.

3.—Blondinette, any other color, cock or hen: E. A. Grosser, 1.

5.—Oriental Frill, cock: Samuel Ellis, 1; Fred. Slinsby, 2; E. A. Grosser, 3.

5.—Oriental Frill, hen: E. A. Grosser 1; F. Murphy, 2; Fred. Slingsby, 3.

5.—Nun, any color, cock or hen: Samuel Ellis, 1 and 2; Hinton Coles, 3.

5.—Flying Homer, blue chequered or black chequered, cock: Jas. E. Stewart, 1; J. M'Grath, 2; H. J. Challis, 3.

9.—Flying Homer, blue chequered or black chequered, hen: Jas. E. Stewart 1; Geo. B. Thomas, 2; Samuel Ellis, 3.

6.—Flying Homer, red chequered, cock: M. Horwitz, 1; Samuel Ellis, 2; Peter Jackson, 3.

6.—Flying Homer, red chequered, hen: Samuel Ellis, 1; M. Horwitz, 2; Peter Jackson, 3.

9.—Flying Homer, any other color, cock: Samuel Ellis, 1; R. Champion, 2; M. Horwitz, 3.

7.—Flying Homer, any other color, hen: Val. Heaton, jun., champion, 1 and 2; Jas. E. Stewart, 3.

9.—Any other variety, not previously specified, cock (breed to be stated): F. Crotty (Pigmy Pouter), 1; Geo. Woodward, 2; A. T. Bolton, jun. (Archangel), 3.

8.—Any Other Variety, not previously specified, hen (breed to be stated): H. Pembroke (Russion Breed Trumpeter), 1; Harold E. Peir, 2; F. Crotty, 3.

A Word of Thanks.

Mr. E. A. Grosser, who judged the pigeons at the recent Broken Hill Show, writes:—I should like to thank all the Silver City Fanciers for the hearty welcome and good time they gave me. There are a lot of real good fanciers up there, just the sort of live pigeon men such as are needed to make the fancy go ahead. Messrs. Hughes, Hammond, Henwood and Dalby for example are "true grit," and there are many others. After judging the birds which took some time, as there were over 250 entries and many of them were wild through lack of training, I had a run round some of the lofts, and had a very pleasant time overhauling the inmates."

A Wonderful Record.

Mr. A. H. Padman's White Leghorns have put up many noteworthy performances during the last few years, but have this season eclipsed their previous best of three wins out of four competitions by scoring four out of four with a world's record to boot. Since Magill days where Mr. Padman's birds, were, if we remember correctly, fourth or fifth on the list, their record has been one of almost uninterrupted progress. A wonderful strain truly. With them climate is apparently immaterial and distance no object, they seem able to win anywhere. Indeed an enthusiastic admirer recently expressed the opinion that they would score in—well, a locality of which our summer heat waves are said to be a foretaste—if entered there. Two or three years ago there were perhaps half a dozen breeders in the Commonwealth whom one could name as being in the same street with Mr. Padman, now there does not appear to be even one in the same parish.

One Minute to Read This.

With 11 entries at 1911 Sydney Show I won 2 champion, 6 first, 3 second, and 2 third prizes. Proof Positive—that I breed and keep only the best. To give Amateurs a start I will give advice free and sell them anything in Blondinettes, Turbits, Nuns, Short-faced Tumblers, etc., at from 5/- each. One hundred to clear before breeding season. Judging accepted at any show on very reasonable terms. Apply — E. A. Grosser, Hamilton, S.A.

Home Notes.

Different Kinds of Pastry.

How very few amateur cooks can make really good wholesome pastry. Undoubtedly the "touch" has a great deal to do with it, for we talk of the "touch" of the pianist or the "touch" of the artist, but how few people realize that the cook requires this same gift of touch when making pastry cake and bread, or even when stirring mixtures, beating eggs or whipping cream.

Any number of us can recall many failures in cooking which we could not understand, but no doubt it was chiefly owing to a careless reading of the recipe or mistakes in measuring.

Now, when quantities are to be measured by teaspoon, tablespoon and cup, the amount will, even with the greatest care, be found to vary every time, although the special measuring cups and spoons that are to be had for this purpose are always used. A half an ounce is a half an ounce at all times, but to measure accurately by spoon or cup requires a wonderfully correct eye for quantities. Certainly there are cooks who can judge these matters to a nicety and invariably get excellent results; but there are others, who neither weigh nor measure, with whom it is generally a hit or miss style, with one day a light cake and the next day a heavy one. One great disadvantage, with even the good non-measuring class, is that it is almost impossible to learn from them; they cannot give you any exact recipe as they rely entirely on the appearance or touch of whatever they are doing. As the amateur dressmaker requires a good pattern before setting to work to cut out a new skirt or bodice, so the young inexperienced cook should look for reliable recipes for her work.

Armed with good instructions, the proper material and a good oven there should not be such a thing as complete failure, although of course practice will make one more perfect and give the deftness in handling that can only be acquired by time.

No one with a hot moist hand can expect to make good light pastry if they handle it much, so it would be preferable for them to choose a recipe which requires no touching with the hands. Often very good pastry is made by rubbing the butter into the flour which when finished should run through the fingers like very fine bread crumbs. To get this result the hand must be cool and free from moisture. Flour should be sifted and butter have all the salt washed out of it.

Many cooks in making puff paste beat it out with the rolling pin till quite thin, then roll it up and put it away on ice or in a very cool place for an hour or so when the beating process may be repeated.

Most rich pastry is best when kept for several days before it is used. Also the addition of lemon juice and the yolk of an egg improves the flavour.

There are so many different kinds of pastry all of which differ according to richness and the purpose for which they are intended that recipes for such are innumerable.

The following are selected from a very reliable source and may prove helpful.

Sift half a pound of flour on to a board and mix together the yolks of two eggs, two teaspoons of lemon juice and half a pint of cold water; with this make a dough of the flour as nearly as possible of the same consistency as the butter. Roll it out about a foot in length, place the butter in the centre, fold over the two ends, turn the pastry round and roll out thinly. Fold it in three, and put in a cool place for ten minutes or longer, then roll twice and put away again. Roll seven times in all, after the butter is added, putting it away between each two rollings. For a good short crust mix half a teaspoonful of baking powder and a pinch of salt, with one pound of flour; put half a pound of lard into the centre of the flour, and with a thin broad knife cut it into small pieces, mixing it well with the flour; it will speedily assume the appearance of bread crumbs. If butter is used in place of lard, it is better to crumble it in lightly with the tips of the fingers, keeping them well covered with flour. Form into a paste with iced water and roll out once or omit the baking powder and roll out three times. For a sweet crust add a teaspoonful of sugar. Here is still another recipe, where cream may be used in place of either butter or lard. Add a pinch of salt to one pound of sifted flour and mix it with very thick cream to make a paste. Roll it out once or twice and send it to the oven at once. Do not press the rolling pin as heavily as with paste mixed with water.

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Conversation.

Conversation is a gift just as much as painting, acting, or playing the piano, only perhaps we do not think it necessary as a rule to give much time or study to improving our conversational powers. We all know how different the same piece of music can sound when played by persons of different temperament. There is something lacking in one performer's rendering and the music fails to interest or touch us as it should, but at some other time the same composition is heard again and with what different results, for this time touch and expression has revealed to the listener the beauties of the composers mind. So in the same way to be a good conversationalist one must possess certain gifts.

A great many people have harsh discordant voices that jar upon a sensitive ear every time they speak.

but nearly every one can improve the tone quality of their voice by observing and listening to the voices of others that are attractive.

How well we all know the woman who from the moment she enters the room usurps all the conversation, wishing all interest to be centred on her and her affairs. Her opinions, on various subjects are forced upon you and you are obliged to give up any argument with her for mere politeness' sake. As a rule, though, she does not argue. She lays down the law rather, quite to her own satisfaction but utterly regardless of any one else's feelings on the subject. No one really bothers his head very much about her, and every one is pleased when she gets up and takes her leave for she has proved herself to be a very uninteresting conversationalist.

Ruskin says about conversation: "The power to converse well is a very great charm. You think any body can talk? How mistaken you are. Anybody can exchange idle gossips. Anybody can recapitulate the troubles of the kitchen, the cost of last new dress and the probable doings of the neighbours. But to talk wisely instructively, freshly, and delightfully is an immense accomplishment. It implies exertion, observation, study of books and people, the receptivity of impression."

Cleaning Out the Range.

Most, if not all, of the comfort of the house depends upon the kitchen range; if this is an inferior article, or if it does not receive proper and regular attention, the whole of the domestic machinery is thrown out of gear.

Where much cooking is done, the flues must be cleaned out once or even twice a week. If the range is small and only a moderate fire is kept burning, once a fortnight should suffice to keep it in good condition. Cleaning out the flues is not an ideal occupation, but by means of a little fore-thought much of its unpleasantness can be avoided. Before commencing, cover the head with a close-fitting cotton cap; this keeps the hair clean. Wear a short skirt, and over it a large apron. Keep the window and door shut, and remove all movable articles, and cover dresser, table, etc., with large newspapers. Spread papers on the hearth, too, as this will save much trouble. Draw forward each damper in turn, and pass the flue brush up and down the upper part of the flue, and then clean the lower part. Take off the plates or pot rings from one side of the range, scrape the under side of the plate, and brush the top of the oven, and round about. Then do the other side in the same way. The soot will now have fallen down to the base. Open the soot door (one on each side), and with the scraper rub off the soot from the bottom of the oven, and draw it out on to the papers spread on the hearth to catch it. Replace all the plates, gather up the soot carefully in the paper, and carry it steadily out into the garden or wherever it is destined to be put.

Now, with an old soft cloth wipe off the superfluous soot from the range floor; clean and polish the range, light a good fire, and wash the kitchen; and if these few hints are carefully followed out, the kitchen will quickly resume its neat and bright appearance.

Home Notes.

— Tired Eyes. —

If the eyes are tired and inflamed from loss of sleep, by sitting up late or long travel, apply in the morning soft white linen, dripping with hot water—as hot as you can bear it—laying the cloth upon the lids. You will feel the eyes strong and free from pain or distress in half-an-hour.

— Rusty Knives. —

Unless the rust has eaten into the metal, they can be freed from it in this way: Rub the blades with a piece of flannel dipped in paraffin, and while they are wet, thrust them repeatedly in the garden earth. If you have no garden, rub them with fine ashes from the grate. Rinse them in warm water, dry, and then clean in the usual way.

— New Saucepans. —

Before using a new saucepan, always fill it with water, add a lump of soda and some potato peelings, and let all stew for some hours: then wash out thoroughly, and all danger of poisoning from the tinned lining will be gone.

— Clean Utensils. —

Nothing more quickly defines the cook than the care of her kitchen. Such utensils that turn with cranks and have oil in their gearings should not be left in water, as the oil is thus washed out and the utensils are quickly spoiled. Clean well with clear, hot water and a brush immediately after using, and dry thoroughly before putting away. Tins should be well dried before putting them away, or they will rust. Do not put pans and kettles partly filled with water on the stove to soak, as it only makes them more difficult to clean. Fill them with cold water, and soak away with the heat.

— Country Custard for Sweet Boiled Pudding. —

Boil together very gently half-a-pint of new milk, a gill of cream, a strip of lemon peel, a bit of cinnamon, and one ounce and a half of sugar until the milk is flavoured with the lemon. Then strain, pour it by degrees into three well-beaten yolks of eggs, and smoothly mix in a teaspoonful of flour, a pinch of salt and a little milk. Mix all well together and put it back into the saucepan, set near the fire, and stir well until the whole resembles a smooth cream.

The Rev.
J.
Williams

for eleven years pastor of the Woolongabba Presbyterian Church, Brisbane, and Principal of the Theological School established there, writes of the great health-creating powers of

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(Signed)
"Revd. J. WILLIAMS."

The herald of good and lasting health, this medicine must be a part of your home. What is better than health? Therefore ensure it. It relieves indigestion, weakness, constipation, weak nerves, poor sleep or appetite. All chemists and stores sell it.

What is the difference between one who walks upstairs and one who gazes up?—One steps upstairs, the other stares up steps.

Tried Recipes.

— Date Pudding. —

Take 1 cup of sugar, 1 cup of sour milk, 1 teaspoon of soda, 1 tablespoon of butter, 1 teaspoon of allspice, 1lb. of seeded and chopped dates. Stir in flour until quite stiff, steam two hours. Sauce—Juice and grated rind of 1 lemon, 1 cup sugar, 1 cup cold water, 1 cup butter, 1 teaspoon cornflour ; let simmer, not boil.

— Portuguese Pudding. —

Whisk together 2 eggs, 3 dessertspoonfuls of marmalade and 2 ozs. of sugar for 5 minutes. Beat 2 ozs. of butter to a cream and add it. Mix well, and then sift in 4 ozs. of flour, stirring carefully all the time. When all the flour is in, beat the whole for a minute or so, pour into a buttered basin, and steam for 3 hours.

— Half Puff Pastry. —

Put 1lb. of flour upon your pastry slab, with 2 ozs. of butter, rub well together with the hands, make a hole in the centre, in which put a pinch of salt and the yolk of an egg, with the juice of a lemon ; mix with water, then roll it out thin, and lay ½lb. of butter prepared as for puff paste ; roll into thin sheets, fold it in three, roll and fold again twice over, lay it in a cold place for a quarter of an hour, give another roll, and it is ready for use. This paste is mostly used for fruit tarts, for which it is well adapted.

— Potato Croquettes. —

Rub 2lb. of cold potatoes through a wire sieve. Put an ounce of butter into a stewpan, and when hot, stir in the potatoes. Take the stewpan off the fire, add the yolks of two raw eggs and a teaspoonful of chopped parsley, some pepper and salt, and cook it again to bind the mixture. When quite cold, shape this mixture into balls and dip in egg and breadcrumbs, and fry in hot fat.

— Kidneys and Bacon. —

Take four sheep's kidneys, one tablespoonful of bacon fat, a little pepper, and 1 oz. of butter. Put the bacon fat into a saucepan which will hold the kidneys, and when it boils put them in whole and skinned. Turn them twice in fifteen minutes, and when nicely browned, take them up, cut each open, sprinkle a little pepper over, put a piece of butter on each, and serve very hot with rashers of bacon.

— Apple Amber Pudding. —

Wash and cut up ½ lb. of apples, and put them into a stewpan with the grated rind and juice of half a lemon and 3 oz. of sugar ; cook till quite tender, then pass through a sieve, and beat the yolks of three eggs into it when quite cool. Have ready a pie-dish lined with paste ; put the fruit into this and bake in a moderate oven till cooked. Beat the whites of the eggs to a stiff froth with ½ oz. of castor sugar, and put this meringue on the top of the apple ; place the dish in a very cool oven until the egg-white is crisp and tinged a very pale fawn in parts. Serve either hot or cold.

— Curried Apples. —

Choose tart cooking apples and cut in half the round way, removing the core. Make a cream by beating together one cupful of dark brown sugar, half a cup of butter, and a teaspoonful of curry powder. Spread the cut side of the apples with this mixture, filling in the hollows left by the removal of the cores. Bake in a quick oven, observing the usual directions for baking apples.

— Potato Cakes. —

Mash a pound of cold potatoes, and make into a paste with a quarter of a pound of flour or meal, two ounces of dripping, a little milk, and pepper and salt. Roll out one and a half inches thick, and bake in a greased tin.

— Indian Pudding. —

An old-fashioned apple Indian pudding calls for two quarts of milk, one cupful of molasses, one cupful of Indian meal, one tablespoonful of finely chopped suet, two teaspoonfuls of salt and one quart of pared and quartered apples. Heat the milk in a double boiler, and when it boils pour it over the meal. Put the mixture in the double boiler and cook for three-quarters of an hour, stirring it often. Add the molasses, apples and suet, and a half teaspoonful each of ginger dish, turn the batter into it, and bake in a slow oven for three hours. Serve with cream. If butter is used in place of suet three tablespoonfuls will be required. Sweet apples are the best for this pudding.

— Orange Delight. —

Cut five or six oranges into thin slices ; pour a cup of sugar over them. Boil one pint of milk, add when boiling the yolks of three eggs, and a teaspoonful of cornflour rubbed smooth in a little cold milk ; stir this constantly until it begins to thicken like custard, then pour over oranges. Beat the whites of the egg to a stiff froth ; add a teaspoonful of sugar ; put over custard, and set in oven to brown. To be eaten cold.

— Passion Fruit Cream. —

Two dozen passion fruit, three ounces sugar, one pint of cream, half an ounce of gelatine. Cut open the passion fruit, and with a spoon remove all the inside, put on to a sieve with the sugar and rub through. Mix with it a few drops of lemon juice, and sugar to taste ; stir into the juice a pint of cream whipped till it is very stiff. Dissolve the gelatine by putting it into cold water and stirring it over the fire till dissolved ; let it cool before using, then strain it into the cream, stirring all the time ; pour into a mould which has been dipped in cold water, and stand in a cool place till firm.

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E. B. COX & CO., Seedsmen, &c., RUNDLE STREET EAST, ADELAIDE.

Open Border Notes for July.

Reminders.

A busy month.

Clear up and dig vacant beds.

A good dressing of lime will do good.

Plant roses, deciduous shrubs and climbers.

Roses may be pruned; thin out flowering shrubs where necessary.

Put in cuttings of roses. Keep the ground well firmed around them.

Watch for slugs or snails and apply Pestend or lime.

Trim all broken and damaged roots before setting any plant.

Reduce top growth in roses and other plants to balance root prunings.

Prepare ground for buffalo or couch grass lawns.

A lawn will last for years but the ground can only be prepared once. Do it well.

Tuberous and bulbous spring and summer flowering bulbs may be put in.

Divide and transplant old stools of chrysanthemums, etc., if not already done.

Make early sowings of half hardy annuals under glass.

Paths should be made or straightened up and trimmed.

Keep up a good supply of leaves, clippings, and garden waste in the compost heap.

Any wood ashes available should be used in the garden, there is a certain amount of potash which the plants will appreciate.

Time for Producing Effect.

There are many who would like to plant trees and shrubs but are kept from doing so by erroneous notions as to the time it will take to produce results. It is possible so to treat trees that they will not grow the same number of inches in 10 years; but on the other hand they may by proper management reach a height of from two to three times as many feet in 10 years from planting. The difference lies in matters that ordinarily are in a large degree within our control. When trees remain almost at a standstill for a long time it indicates either that they were of poor quality in the beginning or in rare cases that the soil cannot be fitted to their wants, but very commonly that they are deprived of the food and moisture they would appropriate if they had the chance.

It is well to know that as a rule shrubs come to maturity quicker than trees. Planted in good soil, these take hold quickly and in a few years show beauty in habit, foliage and flowers that is scarcely excelled in after years, though they may increase in size. Planting is often delayed from year to year until sufficient time has passed to have allowed the trees to make large growth had they been set when the idea was first entertained. Any shrub or tree, with good treatment, may be counted on to reach a very pleasing size in from two to six years from planting. How soon such a period slips by!

Finally it is well to bear in mind that "the way to get started is to start." To debate too long on pros and cons consumes energies without result. Do something and do it now.

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Messrs. E. B. Cox & Co.

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Soils and Fertilisers for Rose-Growing.

It is not possible to state definitely what amount of phosphoric acid, potash and nitrogen should be contained in a soil that would bring the rose to its highest state of perfection. Nor in the present state of our knowledge of such matters can this be done for any plant, though it is possible as the result of experiment to offer certain general recommendations for the fertilisation of many plants.

Where roses are grown for cut flowers applications of fertilising materials containing relatively a large proportion of phosphoric acid with small amounts of nitrogen and potash produce the best results. In many cases application of bone meal, used singly, is sufficient to supply the phosphoric acid and nitrogen, the soil itself containing sufficient potash. This is especially the case when certain clay or clay loam soils were used, these soils being drived from rocks rich in potash bearing minerals.

The idea of analyzing the plant and the soil and adding to the latter the kind and amount of fertilizing material shown to be necessary as the results of such analysis is an old one. This method is adapted only for laboratory experiments where all conditions are controlled. When attempted on a large scale in open air cultivation, where the soil is constantly undergoing many changes, chemical, physical and biological, this results in the introduction of many factors over which it is impossible to exercise the necessary control, thereby rendering such a method useless for practical purposes.

It is true that a sample of soil can be accurately analyzed and the exact composition of the sample determined, but by reason of the changes noted above the analysis should be held to represent the soil only in a general way. Such an analysis is valuable chiefly for showing a general deficiency of some particular substance, lime for instance, rather than as a guide to the proper fertilization. Moreover, there is no method by which the availability for plant use of the substance found can be determined.

The value of grass roots—in fact all vegetable matter in a soil is due to the formation, by its decomposition in the soil, of humus, and to the further fact that during the process of decomposition there are produced acids that enter into combination with the minerals present in the soil, rendering some of them more soluble in their new form, hence more available for the use of the plants. Besides which, all green plants contain all the mineral elements necessary for plant growth, and by the decay of such vegetable matter these minerals are left in the soil for the succeeding crop. When too great a quantity of green plant matter is added to the soil there is danger of producing excessive quantities of acids, more than necessary to act on the soil minerals, thus leaving the soil itself in a " sour " or acid condition. The addition of lime hastens the decomposition of such vegetable matter and neutralizes such acid conditions. Lime also has a physical effect in soils—rendering clayey, stiff soils more open and porous and causing sandy soils to become more compact.

It is not likely that the amount of lime found in water that is fit for domestic use; even if " hard," will be sufficient to produce any appreciable effect on roses. Some classes of plants, azaleas, rhododendrons, etc., are intolerant of any small amounts of lime, however.

High grade acid phosphate is the most quickly available source of phosphoric acid and contains neither nitrogen or potash. Animal bone is less quickly available and contains both nitrogen and phosphate of lime. For roses, when potash is used, sulphate of potash is to be preferred to the muriate or to kainit. Use by mixing thoroughly throughout the soil before planting, and by dissolving in water and applying as a liquid after plants are established and it it is desirable to force them.

Still, after all chemical fertilisers have been applied (to what would seem an ideal soil for growing roses) in proper proportion and form there is still room for the addition of a sheep manure top dressing, cow manure mulch, cow manure liquid applications, or some other form of feeding, and be a success.

It is a known fact that soil containing an ample supply of phosphoric acid in a proper form and containing absolutely no nitrogen is practically worthless, or if a soil contains plenty of all other plant food elements in their proper proportions and is lacking in one it is of no benefit.—Mr. G. Bodyley in " Horticulture."

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Ancient Gardeners.

In " Paradise Lost," Milton has pictured Eve as the first gardener going round her happy Eden, tending tenderly the young plants and giving them their names. The sweet inheritance passed, with a renewed world, to her descendants. Abraham planted a grove at Beersheba, Moses gave precise directions for the management of the vine, Solomon was wise in the lore

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of the plants, but probably the first attempt at real gardening to be recorded—the conversion of treeless wastes into green prospects, in which, long afterwards, the monks were so adept—was Nebuchadnezzar's groves at Babylon, planted for his Median Queen. From the time of Mahabad the Persians had gardens, we are told, and Sir Thomas Browne assures us that Cyrus planted his trees and vines in "straight lines, parallel, or crossing each other in imitation of soldiers led to battle"; according to Figueorra, Ambassador from Spain in 1617, the royal gardens at Shiraz had this same uniformity in modern times. Uniformity in planting was the first habit; it is the same in India and further east on the map of Asia. Homer, in speaking of the gardens of Laertes, refered to the "squandron'd vineyards"; and he also mentions the olive, fig, and pendant pear, which, not being indigenous in Greece, shows that the art of gardening was already known and successfully practiced. Thoreau has well put it that husbandry, among the venerable arts like hunting and fishing, is as honorable a trade as the sun, moon, and winds pursue, coeval with the faculties of man, invented when these were invented, though the poets would fain make them to have been gradually learned and taught.

The Greeks were great lovers of Nature. The fair clustering narcissus and the crocus were among the glories of Attica, and the culture of the violet was so well understood that the Athenians were able to bring them to market when snow was lying on the ground. Roses were favorites then as now; Cleopatra is said to have expended £200 in rose blooms to decorate her supper table.

The Romans were devotees of the rose and all flowers; indeed, under Augustus, they carried their passion so far that the sumptuary laws had to be imposed. In the gardens of Lucullus and Nero were artificial hills and sheets of water (Bacon's ideal garden would have, he tells us, "a fair mount with three ascents and alleys") and immense towers, rose gardens, 1 dered with flowers and aromatic shrubs; this was of course very sumptuous, but no doubt every Roman garden had fruits and herbs and flowers. Virgil says that had he written of horticulture he would not have omitted the narcissus, acanthus, the ivy, the myrtle, a the rose gardens of Pastum. Th fashion, which obtained down Elizabethan days of clipping tre into arbitrary shapes, early asserted itself. Cypress trees so treated appear in the paintings found at Herculaneum. Pliny, describing the garden at his Tuscan villa, speaks of the box clipped "into a thousands different forms," and mentions the fountains and alcoves. Ornamental gardening received a crushing blow in the fall of the Roman Empire, after which horticulture scarce numbered a follower for many years, except in the cloistered repose of the monastery, where indeed, acting on the precept of Mithridates to cultivate medicinal plants, everything of use would certainly find a place, and the gifts of wandering friars brought home, like the saffron crocus, in the hollow of a staff, would add many a gem to the Abbott's garden.

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Rose Mildew.

Though common enough unfortunately many people still ask: What is this disease which disfigures our Rose trees and their flowers; and how can it be kept in check? The great secret—I call it a secret, because it is known to comparatively few rosarians—is to attack the enemy before it becomes visible to the naked eye, for the spores of mildew may have taken root as it were on the leaves a week, or even weeks, before they are suspected of being there at all.

I learned some time ago that I had invariably begun my defensive operations too late, for it was only when the first patches of mildew were visible on the leaves that I had thought of attacking them; whereas, had I acted wisely, I ought to have commenced sulphuring or spraying the plants directly after they had been pruned in the spring, and when very little young foliage had made its appearance.

I have said the great secret is to forestall the enemy; but there is another consideration equally important, and that is to allow the enemy afterwards no rest. That is to say, on noticing any slight curl in the foliage and the white mould accompanying it, the plan is to at once take means for destroying this insidious pest—the greatest and most common of all ills the Rose is heir to—on the plants so affected. Should the mildew afterwards show signs of spreading over the collection, the same measures should be adopted with the whole of the plants, whether affected or not. This may appear rather a large order; but in practice it will be found that, if the Roses are to be kept clean and in a growing and flowering condition throughout the season, there will be in the end a greater saving of time and trouble than if only half-measures had been adopted in the early stages of the attack.

As regards preventives of mildew and their application, for years I used nothing but flowers of sulphur, which was dusted lightly over the plants by means of a small muslin bag.—E. Mawley, in "The Garden."

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What Constitutes a Well-Kept Garden.

A correspondent to the "Garden" answers the question as follows: By "well-kept" I do not suggest elaborateness, but rather those details of neatness and trimness we are so pleased to note among our fellow-men. A garden, be it large or small, may be as much an index to the mind and the home of its owner as the clothes we select for our personal wear is to our tastes and preferences in such matters, each in its way being but a reflection of the mind on matter. Hence the garish-looking garden is never the outcome of quiet, sober tastes, since the latter will be content to aim at the perfecting of harmonies rather than to dream of satisfaction in flaring masses of colour which, while inflaming the vision, but render it unfit for a more complete enjoyment of those greater beauties of plant-life—form and the like—whose greatest of all charms is simplicity.

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Pruning the Rose.

Before beginning to prune a rose bush one ought to know the reasons why pruning is necessary. Well, the following will, I think, teach you most of the Whys and Hows of pruning.

Pruning consists of :—

(1) In removing those parts which are dying back or awkwardly placed, so as to assist the perfect development of the useful portions which ought to be preserved.

(2) To thin out the superfluous growth, as the Rose produces many more shoots every year than its sap can bring to perfection.

(3) To shorten back the shoots, so as to concentrate the sap in certain of the eyes at their bases, so that these eyes may be able to produce flower-bearing branches.

(4) To replace every year the branches that have flowered by young branches to flower in their turn. We know that the blossom is produced on the current year's shoots ; it is necessary, therefore, to assist the development of the shoots by the removal of those that have flowered.

(5) To evenly distribute the sap by giving to the branches a suitable direction and even height, so that they may be all equally strong and floriferous, and that it may be possible to enjoy their blossoms from a single point of view.

(6) To increase the number of the branches ; for if one prunes a branch, one is sure to obtain, below the part pruned away, two or three shoots, which will form as many branches, of the height and in the positions required.

To some of my readers all this may appear very elementary, while to others it may be helpful. I make no apology for inserting it here, because my experience shows that the reason that people make such sad mistakes in pruning Roses is that they have never grasped the raison d'etre of it.

Let us remember also that :—

(1) We give vigour to a branch by pruning it hard, if all the other branches are cut equally short. It is evident that the concentration of the sap will cause all the branches to develop with equal vigour.

(2) We weaken a branch by pruning it hard if the other branches are left long. The sap flows by preference through the long branches, and leaves the short one in a state of marked inferiority.

(3) We give vigour to a branch by leaving it long if all the other branches are pruned short. The long branch dominates the others ; and being higher and furnished with a larger number of eyes, it attracts to itself all the sap.

— Method of Pruning. —

A few words as to the best method to adopt in the pruning of various classes of roses may not be out of place. Hybrid perpetual roses are upright in growth and deciduous, or nearly so. In pruning this class of rose some people practice autumn pruning, but that system, in our opinion, is not desirable, as, during a mild winter, the buds that were expected to remain dormant will be unduly excited into growth, and will flower too early in the season to throw good blooms. Undoubtedly the best time to prune these roses in a climate such as ours, is the end of July. In pruning all weak and badly ripened wood should first be removed, as it never bears good flowers. Afterwards the shoots which are misplaced and tend to cross each other should be cut out, always retaining the symmetry of the plant. The shoots left should then be shortened back, according to their strength. The strong shoots should have about eight eyes left, or perhaps more, if they are very strong growers, while the weaker-growing shoots should be shortened back to about four eyes, making the cut about a quarter of an inch above the eye, invariably choosing an eye that is pointing outwards. The reason for this is the growth of the plant will spread outwards, leaving the centre of the bush open, thereby allowing the wood to ripen properly, and the flowers to fully develop.

Teas, hybrid teas, noisettes, Bourbons, and polyantha roses require pretty well the same kind of treatment, or so nearly so that the following remarks will be fairly applicable to all the sections named. Unlike the hybrid perpetual, these varieties are more shrubby in growth, and, as a rule, do not grow such strong wood. They have fine glossy foliage, and are more constant bloomers, and, therefore, require rather different treatment. These roses do not require to be so closely pruned as the hybrid perpetual ; in fact, we have seen them go on year after year, producing large quantities of flowers, without any pruning further than the removing of dead wood. Where the flowers are wanted for garden decoration only, and quantity is of more consequence than quality, the above system will recommend itself, because of its simplicity, and small amount of labor entailed. To grow good flowers (and most growers, we imagine, desire that), it is necessary to prune, and to prune with care. All dead, weakly, and unhealthy wood should be first removed. It will then be easy to see how to carry out the rest of the work, which will consist in shortening back the leading growth about half-way, always recollecting that the stronger the growth the more of it should be left, and the

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weaker the shoot the more should be cut. Bush teas and other varieties under consideration often throw up strong healthy shoots from the roots (very often misnamed water shoots). These should be encouraged, and room made for them as they grow, so that they may take the place of old and dilapidated wood. A true water shoot never throws any lateral branches, and bears a cluster of flowers on top only. They should be cut down to within a few inches of the ground, which will induce them to break and throw up useful wood. Some of the weaker-growing varieties will require to be more severely pruned than has been recommended, always bearing in mind that hard pruning means a stronger growth of wood, and, therefore, in weak growing varieties, a more plentiful supply of flowers.

— Climbing Roses. —

The pruning of climbing roses, after once the plants have filled the space allotted to them, will consist of keeping up a succession of strong, healthy shoots, to take the place of the older wood. Another matter of material importance in climbing roses is to keep the bottom portion of the plants well furnished with young shoots. The tendency being for the preponderance of growth to get to the top of the plants, while the bottom gets bare and unsightly.

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Leaves.

— And How to Utilise Them. —

The season is once more with us when the trees are casting their summer mantle and putting on that of winter. The rake and broom will be busy for some time in endeavouring to keep the gardens tidy. The value of these fallen leaves cannot be over-estimated, and every endeavour should be made to procure as many as possible and store up for future use. In large gardens a place is usually set apart for their reception. This is not so easy of accomplishment in small ones; still no place is so small but that some odd corner could be found in which to place them. With the aid of a few hurdles a place could easily be squared off or a hole dug in the ground for them.

It is surprising the amount that will go into a small space if thoroughly trodden down. When sufficient has been collected, some turf or soil may in either instance be placed on top, thus preventing all fear of them being blown about with the wind. In this way they will readily decay, with the result that a nice heap of leaf mould will be available for use as required. Its importance as a medium in potting soil is too well known to need comment, whilst for addition to flower beds, borders, or anywhere where the soil is required to be kept moderately open, it is invaluable.

For gathering up leaves from walks, lawns, etc., the most useful thing is a pair of boards, about 9 or 10 inches wide and 16 or 18 inches in length. From a strip of feather-edged, or more properly, weather boarding, a pair can easily be cut, and is the exact thing for the purpose, since one edge is about 1in. thick and the other by means of a gentle slope is about ¼in. With these one is enabled to rapidly gather up the leaves and other rubbish far easier than would be the case with the hands or an ordinary shovel.

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Violas.

Violas or tufted pansies are excellent plants for bedding. They are hybrids between Alpine violets and pansies. In England they are very extensively grown, but are little cultivated here. Why these very pretty compact-growing plants are not more often seen in our gardens we do not know, for they are easily grown. They are true perennials, and keep on growing after flowering. Their habit is exceedingly neat; they are of numerous colours, the yellows being very effective, but hardly less so are the crimsons, whites, purples, and violets. They look best when grown in beds by themselves, but they may also be grown in the mixed border. They thrive best in fibry, loamy soil, with some road grit, and well-decayed cow or horse manure worked in with it. When blooming, the plants should be well mulched, and they must not be allowed to become dry. A position neither too sunny nor too shady is best for these plants. The common pansy has been largely bred from Viola tricolor, an annual, and is less perennial in its habit than violas which have been raised on the maternal side from true perennial species. The distribution between the two is now an arbitrary one of the florists. As a rule, the violas have no solid markings like the blotches of pansies, and are best fitted, on account of their habit and purity of colour, for bedding purposes.

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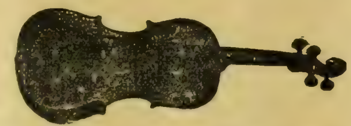

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Plant Samsons.

A melon is nearly all water. It has only about one-twentieth of solid matter in its composition. Yet Sandow himself could not emulate the feats of strength which a melon can perform when it is in full growth. The following experiment was made a year or two ago by a well-known botanist. He selected a melon 18 days old and of a circumference of 27 inches, and fixed a sort of harness around it, with a long lever attached. A weight was fixed to the end of the lever, and the power of the melon's growth was measured by the weight it lifted as it increased in size. On the second day after the harness was fixed it was lifting 60 pounds, and 17 days later it was raising 5,000 pounds, or two and a half tons, clear from the ground.

During the spring any deciduous trees might be made to compress air enough to run an engine. At that time of the year every vegetable developes a capacity for picking up by means of its roots great quantities of water and forcing this moisture upwards through its trunk and branches to the buds which are bursting on the top of every twig.

The first experimenter on the power thus exerted by growing plants was Dr. Hales, an English clergyman. It was he who ascertained the force with which sap rises up the stem. To effect this, he cut off the stock of a vine at a height of about a foot from the ground, and on this fixed a glass tube with a V-shaped curve in it. The lower part of the V he filled with mercury. The flowing sap accumulating in the interior of the cut stem soon began to force the mercury down on one side of the tube and raise it on the other until the pressure exerted rose to 38in. In other words, the sap flow was sufficiently powerful to move a column of mercury in addition to the weight of the atmosphere to this height.

Thus the force which impels the sap through the vine is five times as great as that which impels the blood through the larger arteries of a horse. By using a tube containing water instead of mercury the pressure of sap in a growing bamboo has been shown to amount to thirty pounds to the square inch. In this experiment, when the end of the tube was tightly corked, the cork was driven out with a loud report.

The rapidity with which drooping leaves revive under a shower is plain proof of the extraordinary quickness with which plant roots take up water and drive it through the stem to their furthest twigs and leaves. One way of showing how rapidly this occurs is by watering a white iris a blue aniline solution. Within about 8 or 10 hours the white petals of the flowers will be seen streaked with blue.

Other plants work much more rapidly than the iris. The willow, for instance, which has no need to be economical, as its roots are always in water, pumps moisture through its trunk at the rate of 3½in. an hour. Water rises through the stem of the sunflower at 25in. an hour.

The tobacco plant, with its wide leaves, contains an immense amount of moisture, and by actual experiment water rises through its thick green stem at the rate of 17½in. an hour.

But the performance of the plants mentioned fades into nothing when compared with that living pumping machine, the water liana. This liana is a huge, rope-like creeper growing in Brazil and owes its name to the fact that even on the most sultry day clear, cool water may be obtained from its stem. A length of about 7ft., cut anywhere within reach, will be found to contain about a pint of water; but it must be cut first at the top. If the bottom end is cut before the top almost the whole of the water will have gone before the second cut can be made. It is clear that this liana raises water at the rate of at least a pint a minute—that is 90 gallons between sunrise and sunset, or nearly 33,000 gallons a year.

Another proof of the enormous pumping power of trees is afforded by the sugar maple of Canada. In spring, when the sap is rising, this tree will yield seven or eight gallons of sap daily for three weeks, and this, of course, represents but a very small quantity of the water which the whole tree takes up. The black birch, another tree from which sugar is made, has been known to yield 1890 gallons of sap in 30 days.

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Sea Sand and Its Uses.

A sea-walled garden—this is how Shakespeare describes our islands, and so many English people live near the sea and will have gardens by it, no matter how great the difficulties they encounter, that a few words about sea-sand and how to use it may not come amiss, says a writer in "The Garden."

Sea-sand is generally plentiful in sea-shore places, but it is not made nearly so much use of as it might be; gardeners often send long distances away to get the sand that is so indispensable for their greenhouses and cuttings, while any quantity of sea-sand could be procured by them without expense and with very little trouble. Experience has taught us not to despise the common sea-sand of the shore. We find it serviceable in the garden, in the greenhouse and indoors.

Quite true, it is not wise to take raw sand straight from the beach and expect to make use of it immediately. This would contain far too much saline matter for safety; but the same sand, after it has been kept some time in heaps and exposed to the elements, dried and wetted, and dried again very likely, can be made use of in many ways. It is particularly good to mix with leaf-mould in potting Geraniums, and there are other plants which respond to it at once. Among them we might mention

Carnations—a fact which will surprise no one who has seen how luxuriantly these flowers bloom close to the edges of the Mediterranean, where they have little else to grow in but sand between the slabs of rock. There is no need to trouble about washing-sea-sand before using it. Nature will do the work admirably for us if we give her time.

As to the garden use of sea-sand, common sense is our best guide. It depends upon the nature of the soil whether the addition of any sand whatever is to be desired. Sea-sand wants careful using. There is, of course, a good deal of salt in it, and salt, like many other good things, is both a poison and a medicine. Rough salt is used to kill the weeds that grow between the flints of the stable-yard, and there is nothing like it for destroying Nettles, root and branch; but in autumn the same thing will be sprinkled on the surface of the Asparagus beds as a stimulant, and a great deal of good it does them.

In some form or another salt is often welcome in the kitchen garden. Naturally so. A large number of our most useful vegetables are found growing in a wild state close to the sea. Such plants might be expected to like what we may call sea-coast foods, whether they are offered in the shape of refuse from the herring fishery, of sea-weeds, or of sea-sand with whatever virtue may be in it. With plants whose origin is clearly marine, there is the same satisfaction in giving them a taste of their native element as there is in giving a fresh green turf to a captive thrush or tufts of Groundsel to a goldfinch. Response is made in the same way to benefits bestowed. Plants that are made happy with food they like have a very practical way of envincing gratitude, and do so in a manner that human beings might well copy.

Gardeners have forgotten it, perhaps, but wild-flower-lovers will easily recall the number of plants now cultivated as vegetables that may be met with in any summer ramble on the sea-coast. Salt marshes are the natural home of Asparagus; Celery (Apium graveolens) is not uncommon in moist and sandy places by the sea-shore; Fennel (Foeniculum vulgare) is a native of our chalky cliffs; and Samphire, at one time such a popular pickle, inhabits rocks just above the reach of waves. The Seabeet (Beta maritima) is said to be the origin of our cultivated Beet, and is easily recognised by its resemblance to the vegetable so common in our gardens. The root-leaves of the wild Beet when boiled are nearly as good as Spinach. A kind of wild Carrot (Daucs maritimus) grows on the coast of Cornwall, and Crambe maritima is no other than the much-prized Seakale, whose clustering heads of brilliant white flowers are so pretty, and whose leaf-stalks when blanched make such capital eating. All these plants may be found on an August ramble by the sea, but it is in June we had better look for the wild Sea-cabbage (Brassica oleracea). When found, please make a note of this, for it is the reputed parent of the entire Cabbage family, such as Broccoli, Cauliflower, Brusssels Sprouts, etc. A fine thing the cabbage! Our old botanists considered it to be a cure for nearly all the ills that flesh is heir to, and the Ancient Greeks were much of the same opinion.

Sea-sand indoors is delightful when arranging cut flowers for the table or dwelling rooms. It should be just moist enough to support the stems securely, and is much pleasanter to use than wire holders because it is so hygienic and preservative. Last Christmas a dozen or so of Tulips sent from the florist with the bulbs attached were placed in a bowl filled with fresh sea-sand; they remained in perfection for many weeks. Identically the same Tulips put in either wet moss or damp earth faded off in half the time. Children in "Poppy-land" playing on the sands often amuse themselves by making little gardens in it.

* * *

Re-Potting Cyclamen.

The ideal soil to use for the purpose is two parts loam, one part peat, and one part leaf-mould, thoroughly mixed with some sand. Before taking the corm out of the pot scrape enough soil away from it to expose the whole of corm without disturbing any of the roots; then by knocking the rim of the pot on the end of the potting-bench the roots, with the rest of the soil adhering, will come out intact. Remove the drainage from the bottom and a good part of the rest of the soil, leaving a ball round the roots. Before putting it back into the same, or perhaps a larger pot, see that a good drainage is put in; then fill in the soil so as to have the top of the corm level with the top of the pot and the surface of the soil high enough to cover half of the corm; press the soil firmly down and give a good watering. Afterwards attend to the watering regularly; never giving any without it is required, yet never allowing it to become perfectly dry. The experienced may tell whether a pot-plant requires water by the weight. By lifting two pots of the same size filled with the same kind of soil, but one damp and the other dry, a marked difference will be found in their weight. This is handy to know, for very often the surface at the top appears dry, while in reality the roots have sufficient moisture.

When the plants are coming into flower give liquid manure, weak, once a week, say half an ounce of guano in a gallon of water. Never allow your plants to seed, but cut off the blooms with a sharp knife or a pair of scissors, as the blooms fade. When the period of rest approaches leave off giving the manure water, and gradually lessen the amount of pure water, but don't allow the roots, even during the period of rest, to become perfectly dry. These plants are readily raised from seed, which should be sown in pans or boxes filled with a mixture of leaf mould, peat, and sand. Sow the seed thinly and cover half an inch with some fine soil. Keep the surface damp. A covering of light moss and a pane of window glass being helpful to do this. The seed often germinates very unevenly, and when up are of slow growth. Keep them in the pan in which they are raised for a year or 18 months, and then pot them up singly into 5-inch pots, and treat in a similar manner to established plants.

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LADY IN ATTENDANCE.

Flowers by Artificial Light.

In arranging flowers for evening use, the first consideration should be their capabilities for lighting up well. This is a subject which well repays careful study, for different colours change by night so much, some losing all their brilliancy and failing to harmonise with their surroundings, others deepening in intensity. Much disappointment may be avoided if these different effects are carefully noted beforehand.

— The Colours. —

As a general rule, blues should be avoided, for although some charming schemes may be worked out with Cornflowers, pale blue Delphiniums (these make a delightful decoration, using the small side shoots only), Plumbago, etc., by daylight, they should be kept in this category only and left alone for evening purposes. Mauve is also an unsatisfactory colour on the whole, but some mauve flowers which have a decided tinge of pink light up well, among others certain Sweet Peas, such as Admiration, Lady Grisel Hamilton and the darker Emily Eckford.

All shades of yellow and orange are good for evening decorations. Nasturtiums, varying in shade from palest lemon to the deepest orange, form a charming combination with a judicious mixture of Montbretias to give the necessary height, and Iceland Poppies in varying shades can hardly be improved upon. Daffodils and Narcissi of all sorts are always effective, either arranged simply with their own leaves in small vases or combined with brown Berberis in a centre bowl. The little early Duc van Thol Tulips (yellow and white) are very dainty, and associate well with Mimosa. Yellows often improve by artificial light, some which are rather a "sour" colour by daylight lighting up well. Reds and picks are always effective, though here again careful selection may be made. Among roses, for instance, pink Maman Cochet deepens rather than loses in colour by artificial light, surpassing in this respect Mrs. John Laing. Liberty is an ideal Rose for decoration, not less for its beautiful colour than for the elegance of its growth. If a combination is preferred, a few pink Roses of the Mme. Lambard type may be used with it, and will help to lighten the effect. Mme. Abel Chatenay is a great favourite of mine for decorations, and so is Belle Siebrecht. Dorothy Perkins lights up well, and shows to ever better advantage with a few touches of the White Rambler. Another satisfactory Rose is the new single Irish Elegance, whose golden and coppery tints will show up admirably and needs no foliage beyond its own. Many of the better-known single Roses who give excellent results, such as Paul's Carmine Pillar, Mrs. O. G. Orpen, Rosa macrantha, etc.

Returning to other flowers, long-stemmed Carnations in many lovely shades of rose and pink make beautiful decorations. Single pink Peonies would be most effective for a bold display on a large table, and among Sweet Peas, Lovely, Prima Donna, King Edward VII., Miss Willmott and Coccinea will be found to give good results. Where a mixture of colouring is not objected to, an old Oriental bowl filled with Sweet Peas in varying shades of colour makes a beautiful centrepiece, a wire stand being placed in the bowl to assist in mounting the blooms (used with their own foliage) to advantage. In arranging flowers for evening, besides considering the colouring, the season and temperature should also be taken into account. Such brilliant flowers as Zinnias, Nasturtiums, Geraniums, etc., seem almost to radiate heat in hot weather, the result being anything but restful. An ideal dinner decoration for a hot summer's night, to be used on a small round table, would be a silver basket of long-stemmed white Roses, such as White Maman Cochet, Innocenta Pirola, Niphetos, etc., trails of Asparagus Fern or Similax coming from it in all directions and trailing lightly on the cloth. A Water Lily bud with a tiny spray of green should float in each finger-bowl; while for an autumn evening a gorgeous colouring may be obtained with tinted sprays of Guelder Rose foliage, Veitchi Virginian Creeper, Rose hips and berries of all kinds, lightened by long sprays of the pretty little Michaelmas Daisy ericoides, which blooms very late in some situations. Golden and bronze Chrysnathemums might replace the berries if preferred.

While on the subject of flowers by artificial light, I should also like to add a note of warning on the necessity of seeing that the candle, lamp, or electric light shades assist the effect and do not swamp the colours of the flowers by being too strong. In arranging flowers lightness and daintiness are the chief things to be aimed at. Avoid overcrowding the blooms, and let the foliage used be belonging to or in keeping with the flowers it assists. The useful little Gypsophila elegans does good service, that and Grasses associating better with many light flowers, such as Sweet Peas, Iceland and Shirley Poppies, etc., than anything else; it also goes well with Carnations in connection with spikes of their own foliage.

Roses are best with their own foliage, sprays of the lighter and smaller-leaved varieties being used with the heavier sorts. Asparagus Ferns of various sorts combine well with all florists' flowers, a kind called scandens being useful and prettier than the better-known A. Sprengeri, though equally easy of cultivation. These remarks apply more particularly to dinner tables, but the combinations suggested may be used equally well for any purpose by artificial light.

I have avoided mentioning Orchids or any of the beautiful hothouse flowers which might be pressed into service, this article being intended more particularly for those who wish to make the most of the means afforded by an ordinary garden and greenhouse. In this connection I hope they may be found useful.—Emily E. Williamson in the "Garden."

An Open Secret.

What makes the farmer's smile so
bright,
His step so firm, his heart so light?
What makes his fields so fair a sight?
Why, POTASH!

What makes him watch with twinkling
eye
His oats and barley, wheat and rye,
While they go climbing toward the sky?
It's POTASH!

What gives him credit everywhere;
Good books to read; good clothes to
wear,
And wins the sweepstakes at the fair?
Why, POTASH!

What keeps his funds from running low?
What makes him rich and goes to show
That debts alone refuse to grow?
It's POTASH!

—N. P. Jones.

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Black Leghorns
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Lockleys Nursery.

The Lockleys Nursery owned by Mr. E. A. Lasscock, whose 1911 catalogue is to hand, is favourably situated on the Henley Beach Road and is within easy distance of town by the Henley Beach cars which pass at frequent intervals throughout the day. The nursery is comparatively a new one but Mr. Lasscock has nevertheless worked up a very desirable and up-to-date stock in all popular lines. In roses we find an excellent list including approved sorts of recent introduction. Mr. Lasscock prides himself on putting out only well rooted hardy stuff which any rose lover may feel confident in planting. In Cactus Dahlias also the collection is a fine one. Pot tubers and green plants in season are listed for sale at very reasonable prices. Carnations and Chrysanthemums are largely grown and we also find a lengthy well selected list of Herbaceous and Bedding plants. The assortment of Hardy Ornamental trees, shrubs, and climbers is a very desirable one. Mr. Lasscock rather specializes in ferns. In addition to large stocks of the better known kinds, in connection with which he places on offer a line of well furnished five in pots of ferns in variety at a price which should attract buyers, several new varieties have been imported which are said to be highly desirable additions to the shadehouse or fernery. Select lists of fruit trees and vines are included. Mr. Lasscock's desire being to distribute only what he considers the very best, but note is made of the fact that any other varieties can be supplied if desired. The Flower seed and Floral business is conducted principally at Mr. Lasscock's depot at Port Adelaide but flower and vegetable seedlings are procurable from the nursery. Wreaths, bouquets, and floral work are supplied and general decorative work undertaken for public or private functions at the shortest notice, executed with despatch and charged for at most reasonable rates. All country orders receive the most careful attention, special pains being taken with all long distance packages and prompt advice of despatch is always sent. For the convenience of correspondents we mention that 34 Henley Beach is the 'phone number and Lockleys, the postal address.

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Soil for Hot Beds.

For hot beds it is advisable to secure a soil that is not too compact, rather a light loam with a fairly good amount of humus in it. Do not attempt to make it rich by the addition of too much stable manure for that encourages fungus development under hot-bed conditions. A soil that has produced you good results in the garden is suitable and for the amateur will give better results than an over rich soil. Rather than offer the excuse of not having a suitable soil, use the best soil you have, and watch results.

Clifton Nursery.

The well-known Clifton Nursery, a short two minutes' walk from the Buckingham Arms on the Walkerville car line, ranks amongst the oldest in the State, for we find from Mr. W. J. Smith's catalogue now before us, that this present year is the sixtieth of its existence. So extended an association with the gardening interest of the State has naturally resulted in the acquisition and maintenance of a very extensive and varied stock. Greenhouse and sharehouse plants have always been somewhat of a special feature at these nurseries and the gardener, amateur or professional, will find full provision made for his requirements in this line. Mr. Smith catalogues a very large assortment of Hardy Ornamental Trees, Shrubs, and Climbers at usual rates with liberal discount for large plantings. In this connection it should be mentioned that every effort is made to secure delivery in the best possible condition. The collection of ferns is very extensive, the Adiantums alone making a lengthy list. Gardeners do not need to be reminded of the beauty and variety of the Clifton exhibits in the Pelargonium section at our Adelaide shows. They have always been a strong line at these nurseries and we find them listed in great variety. Regal, Decorative, Fancy, Show, Zonale, Ive-leaf, and Bi-coloured being included. Prices in all cases are attractive and we might add that any collection sent out by Mr. Smith would give satisfaction and be a most pleasing feature in open garden or under glass. This is to be a Carnation year for has it not been chosen as the Coronation flower. Loyal gardeners will find a very wide selection to choose from. Other lines of which mention should be made are Cyclamen in great variety, which Mr. Smith grows largely and very successfully. Cinerarias of which he has a large stock. Fuschias in many forms. Gorgeous Begonias and the less brilliant but equally beautiful Primulas. In Roses Mr. Smith places before the public a list which should meet the requirements of even the most exacting rose grower. In fruit trees we find a liberal assortment at standard prices, including export and approved varieties in apples and pears. Intending planters of peaches, nectarines, apricots, plums, cherries, figs, etc., are well catered for. All the best Oranges are listed including Washington Navel, Golden Nugget, and Golden Buckeye Navel, etc. A full line of other citrus trees, grape vines and miscellaneous fruits is also stocked. Cut flowers can always be supplied at short notice also any form of floral work to order. Catalogues are posted on receipt of request by letter or by 'phone. 372 Central.

Hollyhocks.

The hollyhock is one of the grandest and showiest of hardy plants, but in this country it is one of the most neglected. When well grown it is unrivalled as a tall, stately plant for late summer and autumn blooming. Years ago hollyhocks were largely grown, both in single blooms and in long spikes, and they rivalled in attraction the dahlia and the chrysanthemum; nowadays they are but seldom seen. One reason of the decadence of the hollyhock is that the plants are subject to a rust which soon spreads, and if not arrested will kill them, but this fungus trouble, if taken in time, can be checked by applying to the plants, by means of a syringe, a very weak solution of Condy's fluid, say, half-pint to one gallon of water. A rather poor soil is better than a very rich one for this plant, but abundant moisture should be given in the summer; in the winter the plants sometimes suffer from excess of wet; therefore the ground should be well drained and trenched. When the flower spikes appear, a liberal mulching with manure should be given, and, in addition to waterings, liquid manure should also be given. At one time double hollyhocks were all the fashion, but the single-flowering kinds have proved the more useful for the garden, although not for exhibition. Nearly all colours are found in these plants. They are easily raised from seed, also by division, by eyes and by cuttings. The plants should have plenty of room, say, three feet apart, and as most of them are tall-growing, should be placed in the back row of the shrubbery.

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The value of stable manure is debatable and no arbitrary figure can be placed on it. Chemists will figure out formulas and set values on the nitrogen content, etc., etc., but often neglect to tell us that the most valuable function of stable manure is entirely aside from its mineral content, i.e., its humus content and its action as an indirect fertilizer; further the mechanical effect, if such a term is allowable, on heavy soils is often of greater value than its mineral content.

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The Clematis.

The genus clematis is scattered nearly all over the face of the earth. The beautiful Clematis indivisa lobata comes from New Zealand; the lovely montana from the Himalayas; montana rubens from the mountains in Eastern Tibet; coccinea from Texas; lanuginosa from China; brachiata from the Cape of Good Hope; patens from Japan; flammula from France; while Clematis aristata is common in many parts of Australia; and the Traveller's Joy (C. vitalba) is well known in England. Tasmania furnishes the gentian-like clematis. C. odorata is a native of the West Indies; but the most gorgeous of the family have been the production of clever hybridists in England and France. Clematises are now entitled to be called florists' flowers, writes the "Australasian." They are a host in themselves, and almost all are pretty.

Clambering over the tea-tree or other native vegetation, in many parts of Australia, we find the native supple-jack (C. aristata) and a variety of it named blanda, almost everywhere; while the "native virgin's bower," or "old man's beard" (C. microphylla) is still more common; its misty, fluffy, seed-pods giving almost a weird effect in the bush during the autumn and winter. Years ago these plants were common on the coast of the Morington Peninsula, but ruthless hands and thoughtless persons have caused it to be scarce in the more-frequented localities.

The clematis is a useful climbing plant. It may be used in many ways. For decorating the verandah, covering a fence, the stump of a tree, for massing in flower-beds, for pot culture, and trained on wires, some of the kinds are eminently suitable. All the species are thoroughly hardy, but some of them require a little more attention than many other climbing plants, and this, perhaps, is the cause of their not being more commonly planted.

They are not particular as to soil. A deep rich soil, with plenty of rotten vegetable manure mixed with it, suits them well, and when the plants are well established they should receive an annual top-dressing of well-decayed manure. They are fond of lime, and, if this be absent from the soil a little should be added. Lack of moisture at the roots is a common cause of the plants not flourishing. Situation is not of very great importance, but it has been observed that they generally do better in a southern or eastern aspect. With good, rich soil, plenty of moisture, and free drainage, they will grow almost anywhere. The clematis has but few insect pests to contend with, but slugs are fond of members of the family.

Improper pruning, or no pruning at all, are probably the chief causes why these beautiful climbers are not the success they should be. Some kinds need close annual pruning, as the flowers are produced upon the current year's growth. Such kinds are Jackmanni and its varieties, Star of India, rubella, magnifica, flammula, and some others. Albert Victor, lanuginosa, Gem, Lady Caroline Neville, Princess of Wales, and a few others blossom from wood matured the previous year: consequently no pruning must be done in spring. Some of the finest varieties require no pruning whatever, except the removal of straggling shoots. Amongst these are John Gould Veitch, Duchess of Edinburgh, Sir Ganet Wolseley, Standishi, and Lady Londesborough.

Propagation is effected by cuttings, grafting, layering, eyes from the roots, and also from seed. Some kinds seed freely, but the stock raised cannot be depended upon, and unless new varieties are wanted, this method of increase is not recommended. Layering may be done in the spring or autumn. Cuttings of the old wood of some of the kinds will strike root if put in in the autumn, but young shoots planted in sand under a bell-glass in the spring root more freely. Bits of roots with eyes attached will emit roots if placed in a gentle bottom heat. Grafting is usually performed in the spring, but where glass and other appliances are available the work may be done at any time. Clematis seed should be sown soon after it is gathered, in a rich, sandy soil, covering it very slightly, and, if placed in a little heat, it will soon germinate, and the young plants will flower during the second year.

Victorian nurserymen of to-day keep in stock very few kinds of these beautiful climbers; only a few firms trouble to catalogue them even, but some years ago they were very popular, and a score or so varieties were obtainable. Ballarat was their headquarters, and nurserymen of that city grew large numbers, supplying metropolitan nurseries with plants of many of the finest kinds, but both supply and demand have unfortunately fallen off. As a proof of the popularity of the clematis in England, we find that some catalogues enumerate and describe nearly a hundred different kinds, and these are classified into spring, summer, and autumn bloomers.

A dozen of the best and most distinct kinds are:—Jackmanni, rich purple; Fair Rosamond, bluish white, red bar; Stella, light, violet, plum bars; Star of India, plum purple, red bars; John Gould Veitch, lavender, double; Lucie Lemoine, double white; Princess of Wales, French white, edged blue; Miss Bateman, white, chocolate anthers; Jeane d'Arc, greyish white; Gem, deep lavender; Montana, a white species; and the old fragrant Flammula, a species with small white flowets.

There are many newer kinds of clematises which should be worth introducing; amongst many others C. montana rubens is pronounced to be the most strikingly beautiful, omitting the garden forms, of all known clematis. It is a native of the mountains of western Hupeh. Its flowers are each 2in. to 3in. across, bright rosy-red, borne in clusters in the axils of the leaves on the old wood. It blooms in a small state, and the colour, unique in the genus, compels attraction by its brilliancy. It is very floriferous.

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The Orchard.

Orchard Drainage.

(Continued from May issue).

Having decided upon the material of which the drain is to be constructed, and given due consideration to the various properties of the soil, the most important thing is to decide in what direction it should be laid. Experience has shown that this should always be along the steepest line of descent, this being the only direction in which a drain has no useless side. A drain laid in such a direction is the only one in which the pipes or other material used are at a relatively lower level than the land on both sides of it. If laid across the side of a hill, a drain practically collects all the water from the top side, the bottom side only drawing the moisture from a few yards of land, according to the steepness of the slope and the depth at which the pipes are laid. The distance apart at which drains should be laid must be determined by the water-holding capacity of the subsoil and the disposition of the earth particles. A cubic foot of compact clay when saturated will hold a greater quantity of water than would a cubic foot of coarse sand. Hence the greater necessity for draining a heavy clay than a somewhat open sand. But while a man must be guided by the possibilities of the place as to the distance apart of the drains, it is as well to mention one point which is essential to the success of such drains as he may put in. Pipes should be laid at a good even grade throughout the distance of the drain. If laid unevenly, hollows are formed in which the water settles, which in dry seasons retain a certain amount of moisture after the rest of the drain is dry. These damp places encourage a tree to send its roots down into and around the pipe, thus causing an obstruction which may ultimately choke the pipe. A common error with beginners is the inordinate size of the pipe or mass of material used in drain construction. A 2in. agricultural pipe, if laid to an even grade, is sufficient for all practical purposes for a distance of at least ten chains, where there is a fall of one in fifty. Beyond this distance it may be well to increase the size of the pipe to, say, one of three-inch bore. Ample provision should, however, be made for carrying water away by using pipes of sufficient calibre; it being a well-known fact that a pipe will discharge more water when running about 4-5ths full than when filled to its utmost capacity. Another idea current with many is that it is necessary for the pipes to be porous. As a matter of fact, the quantity of water that finds its way into a pipe through the pores is almost infinitesimal when compared with that which gains admission between the joints of pipes laid closely together, at say, 1-20th of an inch from one another, which is about as close as it is possible to lay them under ordinary conditions.

— Effects of Drainage. —

Apart from the actual carrying-off of the surplus water in the soil, drainage exerts other beneficial effects. Chief amongst these are the aeration of the soil, the promotion of bacterial growth, and the likelihood of earlier crops. When rain falls upon land that has been thoroughly drained, it carries with it some of the carbonic-acid gas of the atmosphere, which is taken with the water as it percolates through the particles of earth down to the conduit which carries it away. This has the effect of keeping the soil open, and preventing it from the caking which would occur in a clay soil. Without underground drains the water would simply soak down until it came upon a hard stratum of rock or other substance, when it would rise again, waterlogging the soil, and making it sour. Instead of this occurring, the nitrogen bacteria in the soil are protected and encouraged to grow by the warmth and aeration of the soil. Proper draining also eliminates organic acids, which, if allowed to remain in the soil, would be injurious to vegetation, and would also have a pernicious effect upon the bacteria. Not only is bad drainage responsible for fruit-trees dying out much earlier than they otherwise would have done, but it also has a detrimental effect upon the production of the tree, causing it to bear considerably less fruit, and fruit of poorer quality. In badly-drained positions fruit-trees soon become stunted, and die out from cold feet, caused by the stagnant water below, and by the soil being colder in winter and more parched in summer. It must be remembered that, with a super-saturated soil, having an impervious subsoil, the surface water can only be got rid of by evaporation, a process which tends to lower the temperature of the soil, thus retarding the early spring growth. It is estimated that there is a difference of ten degrees Fahrenheit between a water-logged and a thoroughly-drained soil, a matter of the greatest importance to an orchardist who aims at producing early fruits. By "Penang" in "The Australasian."

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The shedding of the leaves of deciduous trees reminds the gardener that all plants other than annuals have a more or less marked period of rest, which under ordinary conditions precedes the blooming and growing season. The resting period of shrubs and trees is usually during the winter and the bloom appears in the spring new growth following the bloom. This is not invariably so for some trees bloom on the current season's wood and in such cases growth must of course take place first. This is so with the orange which is evergreen, with the persimmon and the vine which are deciduous and with most roses.

The Passing of the Bitter Pit—Arsenate of Lead Myth.

Though there has not as yet, as far as we are aware, been any announcement made respecting the official funeral of the Bitter Pit—Arsenate of Lead bogey, what will probably prove to have been the first step towards its decent interment took place recently. The sad event is recorded as follows in "The Leader."

"A committee, comprising Dr. Norris, Dr. Cameron, Professor Ewart, Mr. W. Laidlaw (biologist of the Department of Agriculture) and Mr. Carmody (chief orchard inspector) on the 10th ult. visited four orchards in the country, situated at Burwood, Oakleigh and Glen Huntly. All the apples examined were taken from unsprayed trees, the owners in each instance having sworn affidavits that their trees had not been treated with arsenate of lead or any other spraying mixture. Each apple was affected with Bitter Pit, and this was agreed to by both Dr. Norris and Professor Ewart, and it was agreed that the test had disproved the theory that arsenate of lead is responsible for the disease. However, the Government Agricultural Chemist, Mr. Rankin Scott, will subject the fruit to a searching laboratory examination in order to prove that no arsenate of lead is present on or in the apples."

The second step in the disposal of the corpse eventuated when Mr. P. Rankin Scott, Government Analyst, and Mr. Laidlaw, Government microscopic expert, after a number of very careful analyses in every instance failed to find any traces of arsenical or lead compounds, in the apples submitted to them by the committee of investigation. Unless, therefore, Professor Ewart has something, and a pretty big something, up his sleeve it is apparent that the "theory" is a dead as Julius Caesar and one is left to wonder as to the nature of the "prima facia evidence" which Mr. Quinn and his associates considered sufficiently important to block the Federal-State arrangements. It would certainly be interesting if somebody would be kind enough to trot it out for public inspection. Mistakes, of course, happen in the best regulated expert circles, indeed we believe, as far as Mr. Quinn's share of this particular one is concerned, that he was drawn into it against his better judgment, which is rather a pity for the opportunity was a quite unusually good one of collecting much kudos. Moral—Never go back on your better judgment.

After all the promulgation of the theory, untenable as it has proved to be has done more good than harm. It has aroused and crystalized a great deal of interest on the subject and has fortunately been shown to be without foundation before affecting this season's work with the spray pump. It has also, no doubt, started scores of amateur theorists on perilous voyages of discovery. Two we know of, one of whom is banking on Sulphate of Iron, the other on Chloride of Potash as being the basis of the real and only "cure." Neither of them by the way are theorists, nor are they only now setting out on their respective voyages, they believe, in fact, that they are nearing port. All the same they are not risking any "explosions" just yet. One other rather unexpected result it has had we notice, that of drawing Melbourne Punch into the field of horticultural discussion. Recalling a previous occasion on which trouble followed the conjunction of an apple and a man with a woman—Dr. White, by the way, is of that gentler sex which rocks the cradle and rules the world, though it is not apparently infallible in the laboratory—it wandered back to the dawn of creation, when it will be remembered the association of this trio led to disastrous and far reaching results.

So much for the past. What of the future? The "Australasian" we believe voices the opinion of a vast majority of the fruit growing world in urging the Federal authorities to fulfil the agreement already made with the different States to carry out the investigations arranged to commence on

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July 1, and continues :—"There appears to be only one course open. The conference of Ministers for Agriculture and the Federal Government distinctly agreed that no man was better qualified to be entrusted with the carrying out of the investigations than Mr. M'Alpine, the Government vegetable pathologist, and all connected with the fruit-growing industry are of the same mind. Such theories as the one just exploded are bound to occur from time to time, and if on each occasion postponements are suggested to enable each separate theory to be investigated, no progress can be made with the work. Particularly at this time of the year is it possible to suggest causes or contributing causes which neither can be investigated nor disproved, and which, under the circumstances, if considered, must lead to further delays. The better plan to adopt would be to make an immediate appointment, and refer such theories to the investigator of the disorder. Fortunately, no harm has been done by the investigation of the theory just advanced; it has rather had an opposite effect, though it went dangerously close to retarding the work for a further period of 12 months. It is, nevertheless, gratifying to find that one more negative result has been added to the list of supposed causes, for by the narrowing down of these theories it becomes the more easy to arrive at conclusions as to the definite cause. The elimination of negative causes can have no other effect than hastening the arrival of a positive result. Fruit-growers all over the Commonwealth require to have a full assurance of the competency of any experimentalist selected to carry out the investigations, and by adherence to the original compact this guarantee will be afforded them."

— An Interesting Contribution. —

A very interesting and thoughtful contribution to the Bitter Pit problem is that put forward by the Tasmanian fruit expert, as follows :—

"The suggestion that bitter pit is due to spraying must be ignored as incorrect, to say the least of it. It is not due to that at all, but to physiological causes, brought about by internal pressure in the fruit, and an accumulation of water causing a rupture of the cellular tissue. This allows a certain amount of atmospheric oxygen, which, in conjunction with enzymes, or ferments, produces a dark-colored oxy-compound. This action prevents the development of the cells in the near vicinity, and little colonies of the cells in the apple die, leaving what is known as "bitter pit," but really a brown spot.

"It has been suggested that the trouble is due to a parasitic fungus, but repeated and thorough investigations by experts have disclosed that insects, fungi, and bacteria are not associated with the disease. This has been proved in several instances, particularly in the Transvaal, where the Government instructed the plant pathologist to investigate the matter. Other investigators have failed to find anything in the way of fungus or bacterial trouble. The report of the Torrey Botanical Club (U.S.A.), issued in September, 1909, stated that while the 'fruit spot," or 'brown spot,' which appears on the skin of the apple, is produced by a fungus, investigators have failed to get any sign of fungus during their investigations into bitter pit, and have come to the conclusion that it is due to physiological causes.

"What supports the conclusion that the trouble is due to physiological causes is that it is found, where proper precautions are taken, that bitter pit is subjugated. The necessary precautions consist of beginning early with the tree after planting, and causing it to receive equally in all parts the provision in the soil for its upkeep; in other words, a proper and even distribution of plant food. A fair knowledge of the component parts of the soil will enable the cultivator to avoid overfeeding. With precautions there is no reason why the ravages of bitter pit should not be largely reduced, and it is done. As the young tree comes more fully into fruit, the pit disappears, which is the soundest proof we have that the trouble is not due to bacteria or fungi, but to over-pressure. Often good rains in February, after a dry January, increase the liability of fruit to become pitted. On the other hand, you may get a consistently moist season, when no stoppage of growth takes place, and there is freedom from bitter pit, especially where the trees are well cropped, whereby the food received from the roots is all used up. I have been investigating this subject very thoroughly for the last five years in various parts of the State, and have had it in mind for the last 15 years.

"The experiments we have been carrying out in the different fruit districts go to prove that where the tree is subject to a treatment that will conduce to the even distribution of leaves, and consequently of strength, the bitter pit gradually dies out, even among trees, young or otherwise, that have never been sprayed. Want of systematic pruning on rational lines increases the liability to bitter pit very greatly. In orchards where I am giving lessons I am bringing about a system that will alter the nature of the trees in this respect altogether. We are not cutting so much off as formerly, but only sufficient to cause a healthy wood growth during the coming season, recognising that we must maintain a healthy condition of wood production if we are to perpetuate plenty of fruit spurs on the trees. In one particular case I have for some time been experimenting with the New York Pippin and Cox's Orange Pippin, which are subject to this trouble. Out of six trees one of each kind has been cut in the ordinary vigorous fashion with young trees, and the other five of each variety have just been thinned out in order to secure sunlight and good ventilation, so that the leaders will head back to promote growth. The result has been that those trees are increasing in yield of fruit very rapidly each year, the bitter pit is dying out, and I am satisfied that in the course of another two years we will have eliminated it from those trees altogether, thus demonstrating that the disease is preventible."

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The Dropping of Fruit.

Blooming time, the prelude to fruiting time, is now at hand. About it clusters two all-important events for the fruitgrower: the setting and the dropping of fruits. Seemingly the more we cultivate and develop fruit-bearing plants the more we must consider these two events. The blossoms on wild species of our fruits nearly all set, but under cultivation but a small percentage of the many, many blossoms in our orchards form fruits. Nor is the reason far to find. The chief end of wild plants is reproduction—to produce seeds—but the energies of cultivated plants are diverted to other channels: the production of the juicy flesh.

Before the fruitgrower can understand well the life events that cluster about sex, he must distinguish clearly between two terms, pollination and fertilisation, terms supposed by many to have practically the same meaning. Pollination is the dusting of the stigma, the female organ of a flower, with pollen, the male element. Fertilisation is the process by which the male element is combined with the ovule, or female element. Fertilisation can take place only after pollination; but a flower may, of course, be pollinated and yet fertilisation not take place, a fact always to be remembered.

Now fertilisation causes fruits to set and to develop. Thus, through the formation of young fruits we may detect within a few days after pollination whether fertilisation has taken place. But a young fruit when first formed has but a slight hold upon life. Unfavourable influences, no matter how slight, may cause it to loose its hold, and so perish.

But fertilisation does not insure the complete development of fruit. Even after perfect fertilisation, so far as it can be determined, much of it drops in every orchard, and without regard as to whether the trees are light or heavy loads.

Weather conditions have much to do with dropping of fruit. Prolonged cold saps the vitality of young fruits and causes many of those of the more tender varieties to perish and let go their hold upon the tree. A scarcely less prolific cause of dropping is rain, whether a dashing shower or a prolonged drizzle at a low temperature. Even extremely moist atmospheric conditions without a fall of rain weaken the chance of full development of fruits if such conditions prevail soon after fruit formation. So, too, a lack of light causes fruit to drop, and thus we may in part explain the greater number of fruits at the tops of trees in well pruned, open-centred trees and in orchards not thickly planted. For the most part the fruitgrower can regulate light, while he can do little with the other factors mentioned as causing dropping.

The early drop, especially of the peach, is a phenomenon of much moment to the fruitgrower. It may be explained as follows:—When fruits reach a certain size the food stored in the tree the previous year is exhausted. Now, if the leaves of such trees are not fully expanded, and if they are not able to furnish a new supply of food, the young fruits drop. The early drop is especially liable to take place if there be one or more of the unfavorable conditions mentioned previously.

There is also in some fruits a tendency to drop in late summer, when the fruits have nearly attained full size and the seeds are making great demands for food. The trees become exhausted and cast a part of their load. If at this time there be a drought, as is often the case, fruit, not infrequently, drops in considerable quantities. To some extent the early drop and late summer drop can be influenced by the grower by supplying the best possible food and moisture conditions in the orchard.

This brings us to the question of food, or lack of food, as a distinct cause of the dropping of the orchard crops. Not only does the quantity of fertilisers in a soil influence the dropping of fruit, but the kind seems to have a decided effect. Thus, it is claimed, with a show of truth, that trees on soils deficient in potash or lime are prone to lose a part of their load. It seems worth while, too, with trees which habitually drop their crop, to try to direct the food to the fruit-bearing branches by pruning out surplus wood, cutting out water sprouts, and by stimulating the growth of fruits the previous season. All factors which are conducive to the best nutrition of the tree influence its capacity to retain the crop.

Lastly, it may be of distinct advantage for a tree to drop a part of its load if it has more fruit than it can bring to the best maturity. If it does not do so naturally, the the fruitgrower should take the matter in hand and thin the crop.
—Journal of Horticulture.

Nitrate-Making Bacteria.

The effect upon the texture of the soil on the presence in it of organic matter — humus or manure — is well known, and is put forward by some as being the most advantageous effect which it is able to produce on the soil. Yet its value as furnishing a supply of plant food to the soil and to the crops there growing is not to be overlooked, but the fact that in this direction it is more economical and convenient to keep up the supply of plant food by the use of an artificial fertiliser tends to cause this value of humus and manure to be underrated.

-- Nitrification. —

One of the first results of the decay of organic matter in the soil is the production of ammonia and its compounds. These compounds, however, are not so easily utilisable by the plants as the salts of nitric acid, and the latter are more readily available than the former under similar conditions. This change from ammonia compounds to nitric acid is the process which is expressed by the term "nitrification," and is one of the most interesting and instructive of Nature's processes which takes place on the soil.

— Experimental Work. —

It was originally assumed to be a purely chemical action, like, say, the rusting of iron, where no bacterial activity is necessary in the least, but the combination of the iron with the oxygen of the air takes place in entirely an inorganic way, with probably the intervention of the carbondioxide of the air, but this production of rust is entirely independent of the action of any bacterial life in any way. If air and ammonia be heated together in a tube which contains spongy platinum the two combine and ammonium nitrate is produced by their combination, and this method of producing the compound is known to be purely chemical. Researches published so far back at 1877, however, showed that the conditions necessary for the formation of nitrates in the soil strongly suggested that bacterial aotion was involved. At a low temperature the process was very slow; as the temperature rises it increases, but reaches a maximum at about [illegible] deg. Fahr. An increase of temperature above this is, however, found to cause a weakening in the activity of the process and at about 130 deg. Fahr. it is no longer noticeable. If also the soil had been previously raised to boiling point of water, it was found later quite incapable of showing the process. This presence of an optimum temperature such that a variation in either direction is less favourable at once suggests the presence and agency of bacterial life, and it is now known conclusively that this is the cause of the production of nitrates in the soil.

— Further Discoveries. —

It was much later than this discovery, however, when it was found that the change was to be expected in two steps, and not in one, and that each step was brought about by a different organism. In the first step only a lesser portion of oxygen is taken into combination with the nitrogen of the ammonia, while the addition of another portion of oxygen to this compound is effected by the second organism. The isolation of the organisms themselves was rendered specially difficult because, as was afterwards found, the nitrifying organisms will not grow on gelatine, and it was long before a medium could be found which would provide suitable material for the organisms. When gelatinous silica was found suitable the isolation became easy, and the study of the bacteria simple and effective.

The micro-organism which effects the first change to nitrous acid is found to exist in at least two types. One, oddly enough, is found only in the soils of the old world, while the other type is found only in the soils of the new. They have slight differences—the latter for example, are slightly larger than the former, but in so far as their work is concerned they both perform the same operation.

— Conversion. —

The next stage—the converting the nitrous acid (nitrites) to nitric acid (nitrates) by the working in of another portion of oxygen—is effected by an organism which, among other characteristics, has the distinction of being the smallest living organism discovered—it is not more than about half the length of the previous type, and about one-tenth its diameter. This class has been called nitrobacter. Both these organisms are present lavishly and abundantly in the surfaces of all ordinary soils; they work together, and it is conclusively proved that neither can do the work of the other, but that both are necessary in order that the complete and double change may be offected. The second organism (the nitric one) has no action whatever on ammonia, and, in fact, if the amount of ammonium carbonate become at all considerable it is injurious to its activity and prevents its action on the nitrite. The conditions under which the activity of these bacteria is carried on most advantageously are simple and well recognised.

— Conditions. —

Darkness, or at least a very feeble light, is one condition which is necessary, for a strong light is prejudicial to the process which they carry on. The soil must not be too dry and the presence of oxygen is absolutely necessary. In the absence of oxygen, in fact, the reverse process—a weakening down of nitrogen compounds (denitrification)—seems to be set up. The advantage to the nitrification on the soil of tillage is without doubt partly owing to this requirement of the bacteria, and to the thorough aeration of the soil when the tillage is thorough. There must also be present in the soil a base with which the nitric acid may combine when it is once produced. Calcium carbonate has been found to be the most suitable, and on this lies one of the points which cause liming a soil to be of such distinct advantage in certain cases. Lastly, the temperature must be suitable, for one condition of all bacterial life is that the temperature—if the activity and development are to be high—must be as near the optimum as possible. The range, as has been already mentioned, is from 40 degrees Fahr. up to about 130 degrees Fahr.; the optimum or best temperature is about 98 or 99 degrees Fahr.—"Canadian Journal of Horticulture."

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A Standard Case.

In common with growers in other States leading South Australian orchardists have long recognized the desirability of the adoption of a standard case in the local fruit trade. The advantages of such a move have been and are obvious but an old custom even if a bad one is difficult to alter. Even with some big growers what was good enough for their fathers has up to the present proved good enough for them whilst for the small grower and casual producer the any-variety case custom is not without its conveniences. A step in the right direction has, however, now been taken by the resolution forwarded to the Advisory Board of Agriculture by the Fruit-growers and Market Gardeners Association to the effect that that body is in favour of the adoption of the standard imperial bushel case for local fruit. A definate statement of this sort coming from such a scource warrants action on the part of the Government and provides a more than usually reasonable excuse for the exercise of their favourite pastime of interfering with other people's business.

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Orchard Notes for July.

The planting of deciduous trees will still be in hand.

No time should be lost in setting out strawberry plants.

The pruning of deciduous trees is in full swing. Unless one has a large area to prune there is nothing to gain by an early start. The plum, apple, and pear may be dealt with early without much disadvantage occurring, but with the peach and apricot late work has its advantages. With the former the loss due to a tendency to cast off many flower buds—owing, perhaps, mainly to their immaturity, caused by a lack of sufficient light when growing—can be largely counteracted by late pruning. In pruning the apricot spurs the presence of good wood buds can be more readily detected, owing to the grey color assumed by the scales on those buds late in winter.

Scions required for grafting purposes should be saved now. The well-ripened shoots of last season provide the best scions. They should be tied in bundles, labelled with a wooden or tin label—paper will rot away too readily—and buried in moist, not sodden, soil.

Slugs sometimes damage them considerably, therefore good sharp sand is the best cover for them. Any trees into the arms of which buds were inserted last summer should now receive attention. The arms should be reduced towards the inserted buds. Some people advocate cutting them right back to the buds, others to leave a stump to which the bud growth may be tied for security. If no pinching can be applied to the bud's early growth, a stub to support it is valuable. As a rule the tying is as time-consuming as pinching, and the one reduction of the arm gives it a better chance of healing than where a stub remains probably to die back deeply into the heartwood below the bud before it is finally removed.

The root-grafting of fruit trees, more particularly in making blight-proof apple trees, will be undertaken now. Sharp knives and deft fingers are essentials to success. The roots should be kept moist during the operation, and the grafted pieces buried in moist soil immediately.

Experience shows that lemons for storage should be cut from the trees as soon as they exhibit slight tinges of yellow upon the skins. They must be handled with great care, as at this stage the surface of the rind is crisp, and scratches or bruises very readily. Cut and carefully handled into boxes, they are then placed in fairly airy sheds for several days to toughen the skins prior to being stored away finally on trays. A cool cellar, exempt from draughts, and packed in single layers on trays, appears to supply all that is necessary to carefully cured and handled fruits.

If time permits, the scraping-off of loose bark and the cutting away of jagged stumps, or cleaning out of knotholes, upon apple, pear, and quince trees in old-moth-infested gardens may be undertaken. Any old bandages now upon the tree stems should be disinfected before being stored for the winter. As soon as the fruit-house is empty, it should be closed and fumigated with sulphur wherever practicable. The black aphis of the peach may be detected sometimes beneath the young shoots of last year. They usually cluster around the buds. If found, they should be sprayed at once with red oil spray.

The reddish burrowings of wood-borers should be looked for when pruning all stone fruit trees. If taken in hand as soon as seen the caterpillars may be caught before they penetrate into the hard wood.

Where any fungus disease of stone fruits, such as shothole, leaf curl, etc., occurred last season the trees should be sprayed with Bordeaux Mixture just before the blossom buds open.

Amateurs should not be too heavy with the knife in pruning nectarine, apricot, or peach trees which have been formed. Shorten back the fruiting wood. If the leaders are getting away, it is best to cut them out. Leaving as much as one can at the bottom and taking out as much as is reasonable at the top is a good working rule.

Any fruitgrower anxious to get the best out of his trees should procure a copy of Quinn's Book on Pruning. The excellent illustrations therein will be found very helpful in clearing up points which may puzzle the amateur yet which are difficult of verbal explanation.

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Points About Pruning.

Now that the leaves have fallen, the build of our fruit trees can be better seen. Where there are too many big limbs, there is generally a lack of good fruiting wood in the body of the tree, and a heavy, useless growth at the top. The more points of gorwth there are at the top, the fewer there will be below. A well-trained tree should bear fruit from the fork to the tops of the branches.

The mistake of leaving too many main limbs is generally made by the inexperienced grower who is loth to remove a lot of good strong shoots. All superfluous shoots and those which have come in the wrong place are better removed in the growing season, as by that means all the strength is directed into the branches which remain and a strong foundation for the head of the tree is laid the first year. A good rule with most trees is to start with three, or at most four, limbs and when these are strong enough to double them. This doubling process must not be continued. however, when there is strong wood at the height of a man's reach, the branches may then run up single and the pruner devote his attention to the growth of lighter wood for filling in the body of the tree. The expression "filling in" should not be taken too literally, as no tree will stand being crowded. Every fruiting branch should be given plenty of room, but their growth should be encouraged wherever there is room. In the peach these subsidiary branches will want renewing pretty frequently. They last longer in apricots. In apples and pears they are good for many years.

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Vegetable Notes for July.

In those localities not subject to severe frosts the planting of potatoes will be in hand. Experience has taught that tubers grown under different conditions are the best for seed. The potato shows signs of rapid deterioration when tubers are constantly re-set in the locality where they were grown. A quicker start is obtained when the buds or eyes have begun to grow. Those with long sprouts should be avoided, as such growths are likely to be broken away in the planting operations. A sound tuber or piece of tuber, with a limited number of strong buds, is to be preferred to one with many which are weaker individually. A plant with a few strong stalks proves more profitable than another with many small ones. In localities where artificial watering is not possible the tubers should be set from 4in. to 6in. deep. Unless the soil is very rich, a good dusting of finely-ground bonedust sprinkled along in the trenches on top of the tubers usually shows good results.

In all operations of planting or sowing, tramping upon the soil while it is very wet should be avoided as far as possible. To this end it is wise to prepare the ground and set each drill, respectively, as the workman proceeds, rather than make a large plot ready and have to trample upon the newly-dug or ploughed land when setting the seeds or plants.

Cabbage, onion, cauliflower, Brussels sprouts, lettuce, kohlrabi will be set out for successional crops. All of these like rich, deep, well-prepared soils, and should comprise, the first kinds to set out upon new land, or old soils which have been recently heavily dressed with farmyard manures.

On land which last season had undergone the above treatment sowings could now be made of carrot, parsnip, onion, swede and ordinary turnip, red and silver beets, broad beans, peas, and spinach. It is always advisable to drill in these crops so that free use may be made of the hoe during their after growth. Small plots of cresses and radish should be sown for salad purposes.

The thinning out of growing crops of carrot, parsnip, turnip, beet, etc., should not be neglected. Every plant must have room for the proper expansion of root and top if high quality is to be obtained. Roughly speaking, from 4in. to 9in. should separate each plant.

The hoe should be kept at work between the drills of growing crops, and light top dressings of superphosphate or sulphate of ammonia applied before the hoeing is given, so that the fertiliser may be incorporated into the soil. We should always remember that such cultivation serves other important purposes than merely the killing of weeds.

Growing crops of potatoes and celery should be banked up as required. In windy localities cabbage and cauliflower plants are often assisted by banking or mounding the soil around their stems.

Slugs and snails often prove troublesome at this season of the year. For the destruction of the former, probably no better remedy exists than the frequent application of fresh lime dusted over the beds at night. For the latter, no substitute has yet displaced the tedious process of hand-gathering the pests and putting them into fresh limewater.

The preparation of beds for the planting of asparagus and rhubarb should be taken in hand. For both, the soil must be thoroughly broken to a depth of about 2ft., and much manure put into the bottom layer. From ½cwt. to 1cwt. of bonedust per rod is often used; or a one-horse drayload of well decomposed farmyard manure. This should be supplemented with a handful of common salt per square yard in the case of the asparagus.

In seed-beds, made in the open ground, late sowings of cabbage and cauliflower seeds should be made.

Those desirous of raising early tomatoes or cucumbers should prepare the hot beds and sow the seeds during this month. A couple of loads of fresh stable manure, upon which a box-frame is set, with its top sloping towards the sun, will do. More fresh manure should be piled around the sides of the frame. The seeds should then be sown in pots, pans, or boxes, and the glass or calico shelter set over them. Any necessary watering should be applied early in the morning, upon sunny days, otherwise the young tender plants will damp off. On sunny days the cover should be removed for several of the mid-day hours. This will admit light and air, and strengthen the tissues of the young plants.

* * *

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107 RUNDLE ST ADELAIDE.

Thomas Slagg: A Short Historical Review.

Thomas slag, or basic phosphatic slag, is a by-product in the modern method of steel manufacture from ores containing noticeable quantities of phosphorus. The process of removing the phosphorus from the ore was discovered by the English engineers Gilchrist and Thomas, and, briefly stated, consists in adding to the so-called converter containing the molten ore a definite quantity of freshly burnt lime, which, after a powerful reaction, is found to be united with the phosphorus, and swims upon the surface of the molten steel in the form of a slag.

— Composition of the Slag. —

The composition of the Thomas or Belgian slag varies according to the character of the ore and the success of the process for removing the impurities.

More or less metallic iron is enclosed in the coarse slag which is generally thoroughly removed from the ground material by the magnet.

— Manurial Value of Slag Recognised. —

The manurial value of the slag was not recognised for a long time; finally experiments revealed that a considerable portion of its phosphoric acid was soluble in dilute citric and carbonic acids, which led to successful field experiments. The only preparation of the slag for fertilizing purposes, when its value was first recognised, consisted in having it finely ground in especially prepared mills.

— Methods for Determining Availability and Adulteration. —

Previous to 1890, by means of pot experiments as well as by laboratory investigations, it was demonstrated that the phosphoric acid in different slags of the same degree of fineness varied in its availability from 30 to 80 or more per cent., and, further, that many brands were adulterated with Belgian or other insoluble mineral phosphates.

The previous method, therefore, of determining the value of a slag by the percentage of total phosphoric acid present and the degree of fineness, was of secondary importance.

In order to detect adulteration with mineral phosphates, a dilute solution of citrate of ammonia and free citric acids was used. The phosphoric acid in all of the mineral phosphates was sparingly soluble in such a reagent, while an unadulterated high-grade slag gave up 80 to 90 parts of its phosphoric acid. Further investigations on various soils with many brands of slag made it clear that the results obtained from pot experiments corresponded quite well with those secured by means of the citric acid solution.

From these experiments it was determined that "the results removed all doubt that the citrate solubility and plant experiments were so nearly proportioned that one had the same right to value the slag according to its content of phosphoric acid soluble in citrate solution as to value a superphosphate by its content of water soluble phosphoric acid."

As a result, the method of determining the relative value of the slag according to its phosphoric acid solubility in a 2 per cent. citric acid solution, was adopted, doing away with the previous standard of total phosphoric acid and fineness.

At the present time practically all of the iron works treat the molten slag as it flows from the converter with hot quartz sand, with the result that the availability of the phosphoric acid is improved from 10 to 30 per cent.

— Chemical Combination of Phosphoric Acid in Slag. —

The form in which the phosphoric acid exists in the slag has never been fully explained. It was formerly supposed that it was combined with lime as a tetra-calcium phosphate, and that this latter compound, being less stable than tri-calcium phosphate, under the influence of dilute acids became easily available to the plants by being decomposed into the calcium salt of the dissolving acid and bi-calcium phosphate. The tetra-lime phosphate, however, has never been made artificially, although it has been recognised by the aid of the microscope in the slag, and exists as a mineral under the name of isoklas.

More recent investigations having shown, as already indicated, that those slags richest in silicic acid of best results, the conclusion followed like phosphoric acid content gave the that a part of the lime must be in the form of lime silicate. It is now generally held, that the phosphoric acid is combined in the slag as a double salt of tri-calcium phosphate and calcium silicate, and that in this form the roots are able to utilise it. It is also believed probable that some of the phosphoric acid is more or less united with iron as a basic iron phosphate.

— The Use or Phosphatic Slag. —

Basic slag has been shown to work especially well upon sour marsh and meadow lands, upon porous, well-aired soils rich in humus, as well as upon sandy soils deficient in lime.

When a rapid development of the crop is not desired, the slag may be

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used exclusively in place of acid phosphate. On the other hand, in cases when it is feared that the crop will not mature early enough, upon heavy, cold land and in high altitudes, where the season is short, acid phosphate should be given the preference..

The phosphoric acid in slag is comparable in its quickness of action to nitrogen in barnyard manure, tankage and green crops; and the phosphoric acid in acid phosphate to the action of nitrogen in nitrate of soda. A combination of slag and sulphate of potash (500 pounds slag and 150 pounds potash) has been found to work especially well upon grass land, and to be very favorable to the development of clover.

— Quantity of Slag per Acre. —

If the soil is particularly deficient in phosphoric acid, one can use as high as from 800 to 900 pounds of slag to the acre, plowed in and supplemented with 200 pounds of acid phosphate.

If, on the contrary, the soil is naturally rich in phosphoric acid, or has been made so by large additions of slag for a series of years (1,000 or more pounds yearly), then it is necessary only to replace from year to year the amount removed by the crop. In such cases it is stated one part of phosphoric acid in basic slag is as valuable as an equal amount in acid phosphate. Massachusetts Station Record."

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Messrs. E. & W. Hackett's 1911 Catalogue.

The 1911 catalogue issued by Messrs. E. & W. Hackett full maintains the reputation of being one of the most complete and well arranged, issued by any seedhouse and nurseryman in the Commonwealth. It is more than a trade price list, being in fact a handy "Enquire Within" in respect to all matters pertaining to farm and garden, woodland and field, for much information as to the How, When, and Where to sow or plant and generally treat plant growth, from the smallest seed to the largest timber tree; whether of native or exotic origin is to be found within its covers. In accordance with their progressive policy the firm this year list a lengthy collection of novelties amongst which the up-to-date gardener will find much to interest him. Novelties are in the nature of things somewhat of a speculation, but being served by the recognised leaders in plant culture of England and the Continent, Messrs. Hackett are able to make their offerings in this line with the fullest confidence. A secondary list of flower seeds of recent introduction is a valuable selection which may be said to include most of the latest and best results of floricultural skill. Large plantings from this list may be safely recommended. There are also a number of new ferns listed. In the vegetable section we find that a liberal selection of new and recent varieties has been added to standard sorts. In fruit trees the firm offer for the first time the true Jordan almond. Having fruited this variety at their nursery they are able to report it a valuable sort, the habit of the tree being semi-erect and a good yielder of fine quality nuts. Two new pomegranates are also offered and we note an attractive novelty in the Otaheite orange which is described as "a dwarf growing variety, very free flowering and fruiting, suitable for pot culture, making a charming subject for table decoration during the whole winter, fruit hanging on till it shrivels." The Florist Flower seed section includes all popular favourites in great variety. Brief but helpful cultural directions being added in each case. The list of Sweet Peas is a particularly full one, examples of all types and colours being included. In this as in other lines Messrs. Hackett make up collections to suit any purse. The general list of flower seeds occupies many well arranged and well illustrated pages, in which the name, class, colour, habit, price, and any special feature of a very large number of subjects for garden decoration, are included. Separate lists of Climbers, Ornamental grasses and Gourds are given also of Flowering Blubs, Tubers, roots, etc., which include a very wide range of choice in all popular and rarer sorts. Buyers of tree, shrub climber and hedge plant seed, whether native or introduced, are liberally catered for, the collection of Eucalypti being specially complete. Opportunity is here given for starting extensive plantations on most economical lines but if preferred healthy well grown stuff may be procured on liberal terms. Greenhouse Plants, Herbaceous and Bedding Plants, Ferns and Lycopods, Palms and Cycads, Camellias, Bouvardias, Carnations, Ericas, Chrysanthemums, Cacti, Fuschias, Pelargoniums, Various Succulent Plants, Aquatic Plants are the headings of some of the special lists in which many attractive offerings are made. Agricultural seeds including grasses, fodders, roots, and cereals, as might be expected occupy considerable space, all needful details and in many cases illustrations of the lines offered being added. The Rose section is extensive including fine collections of Ever-blooming, Spring-blooming, Climbing, Moss, Hybrid, Sweet Briars, Miscellaneous Roses, and a valuable list of the more fragrant sorts, at standard prices. Orchardists are as usual liberally provided for, all approved sorts appearing in this section. Under Miscellaneous fruits an interesting list, might well tempt the amateur to experiment with some of the lesser known varieties. The Feigoa Sellowiana for instance adds a handsome appearance and beauty of bloom to the delicacy of its fruit which somewhat resembles the Passion Fruit. One of these trees fruited freely at the Botanic Gardens last season and the fruit was highly praised by those who tasted it. Space forbids mention of many other lines in this catalogue such as special and general manures, insecticides, and fungicides, open garden and plant house requisites, poultry requisites, etc., but the fact may be noted that its value is added to by the inclusion of an admirable index by means of which any one of the many thousand items listed can be readily found. All business is transacted on the usual trade terms which clients may rely on being liberally interpreted and a statement of which may be found included in this catalogue a copy of which may be obtained on application.

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The Chestnut.

The edible chestnut, though suitable for cultivation in many parts of the Commonwealth, is little grown, whilst the nut itself, though of very considerable nutritive value is practically unknown as an article of diet, yet in Southern Europe, and throughout large areas of Asia it is one of the staple foods of millions of people. It is prepared in a variety of ways, either steamed, baked, roasted or boiled, and eaten with salt and milk. When ground the meal may be made into porridge or mixed with fat it forms, when baked, a rather heavy but sweet and nutritious cake. In parts of China, in Japan, and in Korea, where the tree grows very luxuriantly, the fruit takes the same place that the potato takes with us. In England, into which very large quantities are imported and in the United States, they are somewhat extensively eaten, though they cannot be said to form a regular article of diet, even amongst the poorer class. Candied chestnuts are well known and the nuts are also largely used as stuffing for pork and poultry (particularly turkey) and as part of a number of desserts and cakes.

TRY HARDY'S FAMOUS WINES

As before mentioned the chestnut grows well in Australia and it is somewhat surprising that we do not produce enough for our requirements, or would be were it not for the fact that we also import great quantities of other things which could be produced at home. As the trees come into bearing early, especially the Japanese varieties, and yield very heavy crops, and require far less cultivation than most fruits, there would appear to be room for considerable plantings in suitable localities, which may be said to include any of the cooler parts of South Australia.

One thing the chestnut insists on and that is a well drained root run. They will thrive well on rather poor sandy land, but object to heavy clay; the ideal soil is loose open land of some depth. They prefer a hillside, even if poor, to a stagnant flat.

Chestnuts are usually propagated from seed and the stocks later grafted or budded with improved varieties. Seed for this purpose can be planted in autumn soon after the nuts are ripe, or kept over until spring and then planted in the seed bed in light sandy soil or pure leaf mould. Seed nuts should not be allowed to become dry after being gathered, and when kept over winter they may be preserved in a box alternating in single layers with moist sand. Holes should be made in the bottom of the box to allow excess moisture to escape. The top should be covered with wire netting to avoid the ravages of rodents and the whole placed in the open ground, some well drained spot being selected for this purpose and the box buried about 6 or 8 inches deep.

When possible, it is best to plant the seed where the tree is expected to grow, since the long tap root of the chestnut renders it somewhat difficult to transplant. Otherwise the seeds are planted in a seed bed in rows wide enough apart to permit of easy cultivation. The following spring they may be planted in the nursery in rows 4 feet apart and about 18 inches distant in the row. In transplanting, the tap root should be pruned back to about one-half its length and all side branches of the stem removed. Frequent cultivation should follow during the summer. It is generally advisable to allow the stocks to remain in the nursery rows at least two seasons before they are grafted. Whip grafts on small stocks make the best union. Cleft grafting is desirable for large stocks.

According to Bulletin, 114, U.S.A., Dept. of Agriculture, trees in the permanent orchard, when of of the European variety, should be set not less than 40 feet, and when of the Japanese, not less than 30 feet apart each way. They are usually pruned to an open spreading form, with 3 to 5 main branches, and cultivation given similar to that of a young apple orchard.

Grafted chestnut trees grow rapidly and Japanese varieties frequently set fruit the first year of the insertion of the scion. Both Japanese and European varieties frequently bear heavy loads of burrs the second year. It is advisable to pick off all fruits for the first three of four years in order that the energy of the tree may be devoted to the production of a vigorous growth of wood and a well-established root-system before reproduction begins.

Nuts are prepared for the market by first plunging in scalding water for 15 minutes and thoroughly stirring. The wormy nuts rise to the top of the water and are removed, after which the water is drained off and the nuts dried in the sun or in the drying house to prevent molding.

It is claimed that Japanese are less affected by fungus diseases than European and American varieties, which are frequently total failures from this cause. Experiments at the Delaware Station indicate that one of the most troublesome of these diseases, viz., leaf blight, may be controlled by spraying trees with three or four applications of Bordeaux mixture.

The advantages of growing Japanese varieties are, according to the (U.S.A.) Delaware Station, as follows :—The trees make perfect unions on American stocks, are easily cared for, come into early bearing, are practically free from blights, have considerable ornamental value, and are enormously productive, while the fruit ripens early and is of large size. The nuts, however, are often of poor quality and the trees subject to overbearing if not thinned.

European varieties are valuable for the finer appearance and quality of their nuts. Some varities are very productive and the tree has considerable timber value. They, however, come into bearing considerably later than the Japanese varieties and are frequently attacked by leaf blights. The young trees are often shy bearers, the nuts ripen later and are more subject to weevil attacks.

The most abundant nutrient in chestnuts is carbohydrates (largely starch). They also contain fairly large amounts of protein and fat. Comparing their composition with that of wheat flour, for example, it will be found that chestnuts are relatively rich in nutritive matter. As the Maine Station states, "the chestnut differs widely from the other common nuts, since it contains much less oil and protein and much more of the carbohydrates, especially starch, which is almost wholly wanting in many nuts."

Only a few experiments have been made on the digestibility of nuts. It is quite commonly believed that oily nuts are not easily digested. According to experiments chestnuts are quite thoroughly digested, being most completely so when they were cooked until soft. From what has been stated it is evident that chestnuts are a nutritious food, which may be prepared in a number of ways. As their value becomes better known, their use will probably become more extended.

* * *

Potash as a Fertiliser.

Potash occurs in Nature principally in the form of salts. It is obtainable in several forms, but is much more restricted in source of supply than either nitrogen or phosphoric acid.

As a fertiliser it is available in the following forms :—

Wood ashes,
Kainit,
Sulphate of Potash,
Muriate of Potash,
Nitrate of Potash,
Barnyard manure and sea weed, etc.

— Wood Ashes. —

When wood is burnt the potash contained in the wood is left in the ashes and is a valuable source of potash as a fertiliser. This is the reason that newly cleared land often yields a heavy crop owing to the amount of ash left on the surface after burning off the timber. Where wood ashes are obtained in quantities they may be mixed with other fertilisers and form a valuable fertiliser. The value of wood ashes as a source of potash is, however, very low, the percentage of potash contained in one ton of pure ashes varying from 2 to 4, which makes the value from 12/- to 24/- per ton. If fresh wood ashes can be obtained and placed on the ground at anything approaching this rate they are a very valuable source of potash. If on the other hand they cost more, some other cheaper forms of potash must be looked for. Apart from their value as a fertiliser, wood ashes act on the soil in a mechanical manner in the same way as humus, by making a clay soil somewhat lighter and a sandy soil more compact.

For most of the other sources of potash we are indebted to the Strassfurt mines in Germany, where the potash salts are found in immense quantities and from there exported to all parts of the world.

— Kainit. —

Kainit is a low-grade potassic fertiliser, consisting of a mixture of sulphate of potash and lime and chloride of magnesium and sodium. It is valuable on account of the potash it contains, which is about 13 per cent. It is of greatest value on dry ground, as if applied on wet ground the salty nature of the material is likely to keep the ground in a moister condition. The greatest drawback to its use is the bulky condition in proportion to the amount of potash it contains, necessitating extra charges for freight and cartage compared with the more concentrated from in sulphate of potash. Kainit is in appearance a whitish salt ; if left in the bags too long it becomes hard and requires to be crushed before mixing with other fertilisers. It is soluble in water and readily available as a plant food. The greatest source of supply is the Strassfurt mines in Germany, from whence it is exported all over the world. It is particularly valuable for crops such as mangels, which require a large quantity of salt.

— Sulphate of Potash. —

Sulphate of Potash, or potassium sulphate, is also found in the Strassfurt mines. It is of a brownish or reddish colour and in the form of a fine powder. It is a high-grade fertiliser, and contains from 52 to 53 per cent. of potash. Four tons of kainit are, therefore, only equal to one ton of sulphate of potash. It is soluble in water and readily available as a food for plants, and is the best source from which to obtain potash as a fertiliser. It is best applied as a top dressing when the plants are well above the ground, or else in a liquid form dissolved in water. Kainit is the crude salt, while sulphate of potash is the more refined article after having been treated in the works which are erected for that purpose in connection with the mines.

— Chloride or Muriate of Potash. —

Chloride or Muriate of Potash is a fine, white crystalline salt, soluble in water and readily available as a plant food. It is obtained from the Strassfurt mines in Germany, and purified at the works erected for the purpose. It contains about 55 per cent. of potash. It is a combination of potash and hydrochloric acid. It is also obtained as a by-product in the manufacture of chlorate of potash, as well as in the purification of nitrate of potash or saltpetre. Owing to the large amount of chlorine which it contains, it is injurious to a number of crops and great care requires to be exercised in its use. It is also not advisable to use it on ground inclined to be salty, as it is likely to give rise to the formation of common salt.

— Nitrate of Potash. —

Nitrate of Potash is another valuable source of potash. It is also known as saltpetre. It contains both nitrogen and potash. It is a high-grade fertiliser. The fertilising ingredients are in a highly concentrated form ; but, as it is used for many purposes other than as a fertiliser, the price is often too high for it to be economically used for this purpose.

Farmyard manure contains a small percentage of potash (only about .3 per cent.) ; but this, combined with the nitrogen and phosphoric acid contained in it, makes farmyard manure a complete fertiliser ; and, if it can be secured at a price in accordance with its contents, it is one of the best fertilisers that can be obtained.

Seaweed contains a small percentage of potash, generally about 5 per cent. ; and, if it can be cheaply obtained, is a valuable fertiliser.

Some guanos contain a small percentage of potash, but it is a very variable quantity.

Other substances which contain a small percentage of potash, and are available in different localities, are preparations made from nightsoil, the deposit from wool-scouring tanks, sheep droppings, ash from sugar cane, deposits of droppings and shells found in caves.

Most mixed fertilisers which are offered for sale contain some percentage of potash, but this is generally added in the form of sulphate of potash by the vendor, so as to give an additional value to the fertiliser.

Potash benefits the plant in the following manner :—

(1.) The woody structure of the plant is better developed.

(2.) The fleshy part of the fruit is improved in flavour and texture.

(3.) The dissemination of starch through the structure of the plant is favoured.

No fertilizer is complete unless it contains some potash.—W.A. Journal of Agriculture.

* * *

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The Farm

Landscape and Color.

Nature, doubtless, has her kindly moods and phases; but her law is universally inexorable. Its influence and incidence are, in the communities of the wild especially, as exacting as the Spartan virtues. In nature the animate has to conform to the laws of the inanimate; the environment of landscape is benignant but persistently dominant with regard to the wild creatures which inhabit in. Nature abhors a dissonant note. If the great flocks and herds of Australia could be allowed to revert to the condition of the wild, instead of having the different species kept distinct by artificial means, the probability is that in the course of time they would, within their respective orders, all assume uniformity of colour, if not of type.

A striking instance of the working of this vital principle of primitive life is afforded by the rapid manner in which the individuality of the rabbit has been effaced by the great Australian landscape. When originally introduced into this country a family of rabbits looked as quaintly picturesque as an old print or a collection of "willow pattern" crockery of rare antiquity; they seemed to be all ears and big soft eyes, and equally pronounced colours, in which the prevailing tints were black and white. In less than half a century (which may be accounted a mere "sprint" in the race of Nature) the rabbit has been almost absolutely transformed in colour; character, and habit by the force of environment. He is less encumbered by superfluity of ear appendage now; has greater muscularity, and consequently greater fleetness and more endurance; and his colour is practically uniform, having assumed the harsh rufous-yellow which is the marked characteristic of the great body of the indigenous animals of Australia.

Excepting in the spring of normal seasons, the dominant note of the plain country is grey and drab; and Nature insists that the wild creatures which choose to make this spacious part of the continent their habitat shall conform to her general colour scheme. Occasionally one sees a black, or a yellow, or a vinaceous chestnut rabbit on the plains, and more rarely still one that is branded brown or white, the marking to some extent resembling that of the rodent in the days of pristine innocence and freedom from the ban of the law. In the mountain region, where, on the whole, environment is less strenuous aad less harsh in its moods, the survival of the original colouring of the rabbit still persists in greater degree; the modification is not so complete. Scores of white and brown, yellow and black rabbits may still be seen under these conditions, whereas the pest has been almost wholly fitted into the landscape of the vast tracts of country where the harsher tones exercise their levelling dominion.

As might be expected, the variation, in a modified sense, is also taking place in the fox. Nature is already busily engaged in obliterating the chestnut lustre developed in softer climes, and which would make the fox a too conspicuous object in the Australian landscape. The hue of his coat is now taking on the more sober tint of his new habitat, because Nature decrees that all her creatures shall adapt themselves to their surroundings. If it had not been for the persistent working of this law from primeval times up to the present scores of the lower orders of animals would, in the ruthless struggle for existence which goes on perpetually, have been wiped out even under perfectly normal conditions, and without the intervention of man. In the course of time the colour of the fox will in all probability harmonize precisely with that of the kangaroo rat, the paddymelon, the wombat, and the other animals which are indigenously adapted to their environment.

In so far as their natural land enemies are concerned, birds, on the other hand, have, with a few remarkable exceptions, no need of protective colouring, and so se see endless varieties of shade among the feathered denizens of the woods. Perhaps the most striking and typical exception is that of the stone plover (curlew), and even this case only serves to emphasize the amazing adaptability and discrimination of this essential law of wild life. The curlew lays her eggs—usually two—on the bare ground, without making even the semblance of a nest. The bird only takes to the wing under quite exceptional circumstances. If pursued, they rely upon their wonderful turn of speed rather than upon the power which they possess in common with others of the order. Because of this habit of living and breeding entirely upon the land Nature has taken care to fit the curlew into the landscape in the matter of colouring. Unless you literally walk on the top of a sitting curlew she will not move, so confident is she that this paternal provision of Nature renders detection almost impossible. To see this outlandish bird, when apprehensive of discovery, adapting itself to the immediate surroundings in point of colour, posture, and form is a revelation in the very elemental qualities of the art of mimicry.

Another manifestation of this principle of natural protection is to be found in the colouration of eggs. As a general thing, the eggs of birds which nest in the open or on the ground are coloured in such a way as to harmonize with their surroundings; the eggs of birds which breed in hollow limbs or other hidden places are, on the contrary, almost invariably white. Occasionally Nature seems to perpetrate a paradox, if not an actual error of design. Take the case of the noisy and ubiquitous minah. This bird has the natural function for producing eggs of the colour that is not likely to attract attention, and yet the foolish creature builds in such exposed positions that the nest is visible and accessible to enemies of the air as well as of the land. The minah is a prolific breeder, and the probability is that it would increase to such an extent that the balance of Nature would be affected were it not that no other tribe is so subject to sustained and wholesale depredations.—S.M. Herald.

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How to Build-up a Profitable Herd.

(From "Hoard's Dairyman.")

But few dairy farmers are fitted, by nature and training, to handle a purebred herd. Although the profits from the registered calves, as well as the milk, are much greater, yet it requires a man who is exact and methodical to keep track of everything, to breed, register, and develop the progeny so as to ensure profitable sales. But there is no reason in the world why any patron of a creamery or cheese factory should not enter upon the work of producing a first class herd of cows. To do this he must first supply himself with a purebred, registered sire. Right here is where so many farmers fall down. They have never made a real, earnest study of the breeding question; their ideas are loose and hazy, and they cannot see why a good-looking grade is not just as potent a sire as a pure-bred.

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So when a grade is offered for 15 to 25 dollars (£3 to £5), and it will cost 100 dollars (£20) to buy a registered bull, they buy the grade and enter upon the work of breeding down the scale, rather than up.

Almost any fairly good cows will do as foundation stock on the female side. A record of some kind should be kept of the milk and butterfat product of each cow. Then the owner can see clearly which of the cows are likely to produce the best heifers. Select, say, 10 to 15 of these heifers, always from the best cows, and start them right on the road to the making of good cows. So many farmers do not realise the importance of thorough care and generous feeding to a young heifer for the first year of her life, if they are to expect her to make a good cow. Our plan is to feed the heifer a regular daily ration of skim-milk until she is ten months to a year old, with a small ration of oats. Somehow this seems to develop her mammary organs, and she gets a start that stays with her even if she is not well treated afterward. When she is 18 to 20 months old breed her to her sire, if she is a strong, vigorous animal. This will double the pure-bred blood in her heifer and make that heifer as responsive nearly to the influence of another pure-bred sire as if she had been a pure-bred herself. This is simply building both sides with the most desirable blood.

It is not only necessary to have good strong seed, but it is equally important to have the best and most responsive soil to plant it in. We have seen a herd of granddaughters of a bull bred in this way from his own daughters which averaged 357 lbs. of butter per cow when the original mothers, the grandmothers, could not reach 200 lbs.

One should keep on in the line of the blood he starts with, in the after purchase of another sire. All over the land can be seen the broken and destructive effects of this mixed up cross breeding, so many farmers practice. Besides the breeding, the farmer should vigorously weed out all but the best cows. After a heifer has been tried for two years at the pail, and does not come up to the right standard, dispose of her and put a better one in her place. Rigid selection is just as necessary as wise breeding. To this end we must keep a record and know what our cows are doing. This is the course that thousands of successful dairy farmers have pursued, and the road is open to all who will travel it.

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The Breeding of Swine.

Before the New York State Breeders' Association, Professor Day, of the Ontario Agricultural College, offered the following advice upon the breeding of swine :—

Constitution.—Without constitution progress is impossible. Constitution is indicated by width and depth at the heart. A broad shoulder-top does not necessarily indicate constitution, but we must look between and back of the forelegs. A strong, muscular neck also indicates constitution. It is not necessary that there should be a hump of fat on top of the neck, but muscular development is important. A broad forehead, a broad, full poll, and a good-sized bright eye are other indications of constitution.

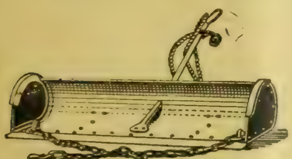
Quality. — This is important from both the breeder's and the consumer's stand-point. I like to see strong, clean, flinty-looking bone in the legs, and to see pasterns that are perfectly upright. The extremely fine bone for which some breeders are aiming has nothing to commend it. There is a relationship between bone and muscle, and when the bone is reduced beyond a certain point it results in a carcass that contains entirely too much fat for the amount of lean. Either extreme is undesirable, and we should aim at a happy medium. The undue reduction of bone also tends to reduce size and lessen fecundity. Other points under quality are general smoothness of form, thickness and evenness of fleshing, smoothness of skin, and fineness of hair.

Fecundity.—This is a point which is frequently overlooked, and yet it is one of prime importance. These little, short-bodied, fine-boned, roly-poly sows cannot be prolific mothers, and if a sow is not a good mother, of what use is she? The good breeding-sow must have a good-sized, roomy frame, and this calls for a fair share of bone. Coarseness is undesirable, but strength of bone and a good length of body are absolutely essential. The mammary glands should be well developed, and there should be not less than twelve fully developed teats.

General Conformation. — In general appearance the animal should show a proportionate development of the different parts, and it should meet the requirements of the butcher and the consumer by carrying flesh of the right kind, and possessing large development of those parts which have the highest market value.

Character.—This is something which is hard to define, and yet the experienced breeder can recognize it at a glance, and knows its importance. It implies conformation to the best type of the breed, but it goes still further. Character in the boar implies a bold, impressive carriage appearance. He is a boar, and shows it at every point and in every motion. In the sow we find the reverse. She should be dignified in her carriage, but there is a femininity about her general appearance and bearing which indicates a prolific and indulgent mother.

Pedigree.—A good many people are inclined to look upon pedigree as something distinct from utility. I cannot fall in with this, when breeding-animals are under consideration. I have frequently been asked. Which is of greater importance, individuality or pedigree? The question does not admit of a definite answer, for it is largely a question of degree; but I can say that neither one is complete without the other—that is to say, the desirable breeding-animal should possess individual merit as well as a good pedigree. If the pedigree of a given animal contains the names of a number of animals noted for the excellence of their progeny from a utility standpoint, then such a pedigree is a strong indication of utility in the animal in question, because the tendency is for "like to produce like." Unfortunately, however, there are always some degenerate offspring from the most illustrious parents, and to breed from a degenerate merely on account of its pedigree would not be holding the proper balance between pedigree and individuality.



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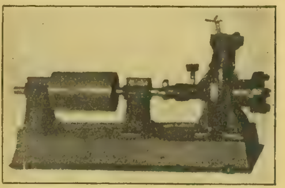

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Whey.

One of the bye-products of cheesemaking is whey, and the useful utilisation of this makes an important addition to the receipts for produce sold. Naturally, of course, feeding pigs is almost the only way of using up the same. In the olden days it was customary to allow one pig to every two cows at a time, and as two pigs could be fatted off during the season,it averaged out at a pig per cow. We have improved on that considerably now, and probably double or even treble the number of pigs are kept to the head of cattle, and with great advantage. Of course, this necessitates the use of a larger amount of purchased food, or of the corn of the farm, but it pays to do so in several ways. As the result of many experiments, it has been found that pigs thrive best with a very moderate amount of water in their food. "Swill" against wetted meal, and wetted meal against dry corn, have been tried, and actually the last came out best. To feed with dry grain would not suit us in the case of dairying, of course, as the object is to utilise the whey, but the moral of the story is to reduce the amount of whey per pig as much as possible—i.e., keep as many pigs to a given number of cows as one possibly can, and only use the whey in quantity sufficient to soak the meal and "burst" the same. Whey used to be valued at one halfpenny per gallon, and it sometimes pays to set it, and take off the cream which has escaped from the curd, and make butter of the same, but it's natural use is to moisten the food of as many swine as possible.—"The Dairy."

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As farmers become more and more educated in their avocation, the higher will become the dignity of farm life, the greater the reward, the more numerous the comforts, and the more attractive the occupation for young men, who are seeking a life of independence and a healthy home for their children.

Clover as a Fertiliser.

The American Fertilizer Magazine, discussing this important question, expresses the opinion that the claim that land can be brought to the highest degree of fertility by growing thereon clover, or some other leguuminous crop, has not been verified so far as the expense is concerned.

It has not been demonstrated that clover will accomplish the desired result in a single season, or even in several years; but while it is admitted that clover is a valuable crop in a system of rotation, yet the yields of crops following the ploughing under of a clover sod do not correspond with the large amount of nitrogen so easily displayed in the figures which give the value of the clover crop. The fact is, that there are farms upon which clover has been grown for many years, but which have not shown the wonderful effects of the crop as claimed, and there are farms on which improvement with clover is more costly than may be supposed.

Clover is being held before the farmer as a panacea for all the ills of poor farming, and it is said to be a medium by which the farmer may solve the problem of dispensing with fertilizers entirely. Unfortunately for the advocates of growing clover for deriving nitrogen from the atmosphere, clover will not grow without being supplied with plant food; and as it is a biennial, at least two years are required for its complete growth. It has not been demonstrated that all of its nitrogen is retained in the soil, and the theory of the work of bacteria has been changed within the past 12 months.

Formerly, it was promulgated that bacteria, clover-seed, and an alkaline soil only were necessary to complete success, but now it is asserted that bacteria work best on soils deficient in nitrogen. This is equivalent to the claim that poor soil and clover will give satisfactory results, provided the bacteria and mineral elements are supplied. Of course, if mineral fertilizers are necessary (which is correct), it will probably be as economical to use the mineral substances, with the addition of nitrogen in some form, directly on the soil, and not wait two years for growing the nitrogen, and that, too, when mineral fertilizers must be purchased in either case. It is true that the clover supplies humus, and so will any other crop that may be ploughed under as green manure. No one can object to the growing of clover, as it is a profitable crop; but it does not differ from other crops in the fact that the best results with clover are obtained when fertilizers are used on the land.

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Hints to Farmers on Mares Foaling.

The period of gestation in mares lasts, approximately, eleven months, or, to be more precise, the average duration of pregnancy is forty-eight weeks and three days. It is, however, subject to some measure of variation, as mares do not always carry the foal for the exact average period. Often a mare foals down a few days, or a week, or even longer, before the full time is out, while it still more frequently occurs that mares go for a little longer than the usual period. It is very commonly found that mares carry a colt foal for a few days longer than a filly foal, but this is not by any means the general rule. When a mare is put to the horse, the last date of service should be carefully recorded by the farmer, so that the time when she is due to foal may be approximately known. It is most important that the farmer should know when his mares are due to foal, so that he may arrange to have them watched; he should, therefore, never fail to make a note of the dates when the mares are served by the horse.

Mares in foal should be kept at work up to the time of foaling—regular work on the farm. When near foaling, they must not, however, be overworked, for nowadays a good draught foal is worth many bags of wheat. The mare requires feeding up to the time of foaling just as she has been habitually fed. The best judge in the world cannot tell just when a mare will foal, signs of foaling being so uncertain. If all is well, a few days before foaling a wax will form on the teats; just before foaling the wax will drop off, and if the milk exudes she should not be left. The mare may foal at any minute, and should do so quickly, but they have been known to go many days with the milk thus exuding and their foal all right. It is, however, a bad sign, and often ends badly. Mishaps at birth are greater in proportion among draughts than among light mares; therefore it is in regard to draught mares that human aid can ofttimes be of immense service. A little knowledge at the time of delivery, even out in the paddock, can be of timely assistance. Approaching parturition is further indicated by a slackening and falling in of the muscles of the loins, and of the croup near the tail.

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This indication is not particularly noticeable, and will escape the notice of all but experienced breeders. When the mare is about to foal she behaves with restlessness, and evinces a great deal of uneasiness, thus showing in unmistakable fashion by her behaviour that her time has arrived. She keeps on moving about in an unsettled manner, and appears nervous, while the expression in her eyes plainly reveals her anxiety and apprehension. Her nervousness may further be evidenced by frequent staling, and by her pawing the ground with her forelegs, while she also lies down repeatedly and gets up again almost immediately afterwards, or she makes attempts to lie down without actually doing so.

In the actual process of delivery, if all is well, the forefeet will present themselves at once; the hand should then be inserted between the legs straight to the knees, and if the foal is coming right the nose will be felt. There will then be no difficulty in getting it away. Assist the mare very gently, but only when she is in labour; the pains will come on at intervals. Do not cut the navel cord; draw the foal gently away until the cord breaks, as it will do in the right place. Further, do not touch the navel with the hand, but pour a little carbolic oil on it at once, and repeat once a day until it has dried up. Having got the foal away, now take the cleansing, or after-birth, away from the mare. After dressing your hand with carbolic oil, insert it about ten inches, and put a gentle pressure on it. It will come away in a minute or two, but the operation is a delicate one, and care must be taken not to break off any portion. Any small portion left behind may cause blood-poisoning and the death of the mare. Teaching the foal to suck is a very difficult undertaking. If it is fairly strong it should be let alone, as it will soon suck of its own accord. If it does not suck in six hours, half a pint of its mother's milk should be given, and again six hours later; by that time it will suck, and thrive well.—Elder's Review.

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In improving dairy stock, it is much more important to get a good bull than a good cow, for a bull is half the herd, while a good cow is only part of the herd.

The worst cow of a herd will probably be either a money loser, or so nearly on the border- line of profit and loss that it will be difficult to tell on which side she is.

After all, there is no place like the farm, and no people like the farmers. The traits of rural character, born of natural environment, and strengthened by wholesome, self-reliant occupation, are a nation's safeguard.

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About Shying in Horses.

From the Live Stock Journal.

It is a widely-held opinion that defective eyesight is a very common cause of shying in horses; but, as a matter of fact, such is by no means the case. Unquestionably defective vision not infrequently accounts for a horse being a shyer, yet it is nothing like so frequently a cause of shying as it is generally held to be.

The principal and most usual cause of the habit of shying is nervousness or fear, the horse shying at some object or other because it is afraid of it, even although it can plainly see it. Habitual shyers are usually either of a highly-strung or nervous temperament, such as is very commonly met with in well-bred horses, or they are of a very timid disposition. It is, of course, well known to horsemen that by far the largest proportion of shyers are mares. The habit of shying is nothing like so often met with in geldings as it is amongst mares, and entire horses are but very rarely given to shying. The reason why this is so is obvious when it is remembered that most usually the cause of shying is nervousness or fear. Mares are, as a rule, of a more excitable or nervous temperament, and more often of a timid disposition than geldings, the latter generally being of a more equable temperament than the former, though there are exceptions, of course, while entires are very high-couraged. Hence one finds in them little shying on account of nervousness or fear, as a rule, and geldings do so much less frequently than mares.

A great many—in fact, it may be said, that most—young horses are more or less giving to shying when they are first put to work, owing to their being unfamiliar with many objects they see, and consequently are afraid of them. When they are taken up to be broken in, young horses, moreover, are very commonly inclined to be somewhat nervous at first, and this naturally renders them very liable to shy on the slightest provocation; but, as a rule, they cease the habit of shying as soon as they become accustomed to the sights of the road, and lose their first greenness and nervousness. Hence the fact that a raw and unmade young horse shies very easily and frequently is a matter of no importance, and no notice need be taken of it, seeing that it is only natural it should do so in view of its greenness, and that in all probability the habit will pretty soon cease of its own accord when once the young animal's natural nervousness and greenness wear off.

Sometimes, however, this habit of shying at unfamiliar or strange objects from pure nervousness or fear—which is so general among young, unmade horses when they are being broken in—persists long after the young horse's education has been completed, and proves itself to be quite incurable, it oftentimes, indeed, gradually becoming worse in such cases. Here we have the confirmed shyer which nothing will cure. The habit, aggravating, or worse, as it is, is, however, the horse's misfortune, not its fault, seeing that it is the result of a highly nervous temperament, or of a too timid disposition; hence it should be kindly and patiently dealt with. In some fortunate cases it may be possible to cure it by dint of careful management and patience, before it gets too firmly rooted; but more generally it is impossible to effect a complete cure when the shying persists after the horse has been thoroughly trained and become fully used to the road, and mostly it is in these circumstances a case of "once a shyer, always a shyer." When once the habit of shying has become firmly established, and when it is due to nervousness, the chances are much against the horse ever being broken of it. It may, perhaps, be improved, if the horse is in the hands of a careful and patient rider or driver, who knows how to deal with it, and takes the trouble to do so. At best, however, one must always be on the qui vive with such shyers, and one is never safe with them, while in many cases the habit is, or becomes, so bad that the animal afflicted with it is a wholly unsafe conveyance, and not fit to be in a private stable.

There is no doubt about it that in a good many cases horses which shy on account of nervousness are rendered worse in this respect by improper or injudicious treatment; in fact, the habit is often established in young horses solely in consequence of gross mismanagement. It is but too common a thing for the rider or driver of a young horse to force it past an object at which it is shying by the infliction of punishment with whip or spur and jobbing it in the mouth. Nothing could be worse than to do this. After this wrong-headed practice has been repeated a couple of times the young horse (horses have excellent memories, especially for disagreeable things) learns to remember that it is punished on shying, and thus whenever it shies it expects punishment to follow immediately, which naturally greatly increases its fears, and causes it to swerve all the more badly or to attempt to run away. The fear of punishment moreover, renders the animal much more inclined to shy, as in these circumstances it does not shy at an object so much as at the punishment which it expects to follow. It does not take long to convert a young horse of a nervous temperament, and which is by nature inclined to shy somewhat easily, into a confirmed and incurable shyer by such senseless treatment.

The proper way to manage a young horse when it shies is to treat it kindly and with patience. On no account must it be punished in any way for shying. Its fear or nervousness should be allayed by speaking quietly to the animal, by patting it on the back, etc.—in brief, by cajoling it, as it were—that will readily calm it. If it objects to go past an object on

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account of its being afraid of it, it should be coaxed in order to induce it to pass the same. It is quite wrong to force it to pass the object by means of punishment. It is a good plan to allow a young horse to have a good look at any object for which it evinces much fear, it being coaxed to go close up to it and to smell at it, so that the animal may convince itself that it is harmless and that its fears are groundless. If this is done, the horse will probably take but little or no notice of the same object next time it passes or encounters it. It is easy enough, as a rule, to overcome and eradicate the propensity to shy which arises from greenness and nervousness in a young, unmade horse by proper and patient management.

Not infrequently horses are addicted to the habit of shying or swerving at certain objects merely as the result of light-heartedness, or of an excess of high spirits, due to their being very fresh or underworked and full of corn. In cases of quite familiar objects, and of which it ordinarily takes no notice whatever, and very often, in addition to shying or swerving, the animal bucks or kicks up its heels at the same time, when it is being ridden. This mischievous or playful—though often very awkward and annoying—kind of shying, which is caused by an exuberance of spirits, is practised only while the horse remains fresh, and ceases as soon as the animal settles down to its work, and has expended its superfluous energy.

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Salt for Sheep.

There exists in most farmers' minds a dimly-conceived idea that salt is good for sheep, and so at regular intervals they supply it to them in varying quantities; but probably few of them really understand the effect this condiment has has upon the digestion or the actual need that exists for it. It is not an accidental craving that causes sheep to so eagerly devour salt, but rather it is a real physical want that demands satisfaction. Hydrochloric acid is one of the chief constituents of the gastric juices of the stomach that play so active a part in digestion, and it is to help supply the chlorine of this acid that salt is necessary. It will be noticed that when sheep have not had salt for a long time they eat it in simply enormous quantities. This is because the supply of chlorine has become depleted and requires replenishing. So it is not simply to lend variety or improve the flavour of food that salt should be given, but rather to supply chlorine for the gastric juices.

Another reason why salt is useful to sheep is because it increases their thirst and causes them to drink water in sufficient quantities to carry on the normal functions of the body. If bulky foods are eaten and only a small quantity of water drunk, impaction often occurs in the digestive tract, and trouble or loss ensues. Moreover, when the water supply is small the assimilated food is not so readily carried to different parts of the body and distributed to the tissues.

Particularly when sheep are in pasture or living largely on grass and cereal crops do they need salt, because these crops contain potassium salts. Potassium has a greater affinity for chlorine than hydrogen. Hence, unless plenty of chlorine is supplied the body, the potassium takes a portion of that which otherwise would combine to form hydrochloric acid.

Either coarse ground or rock salt may be used for feeding, as preferred. There is probably more waste in connection with the ground salt, but licking the rock salt sometimes makes the sheeps' mouths and tongues sore. If coarse salt is used, a tight trough, covered with a little roof as a protection from the rain, should be provided.

The average ewe requires from three to five pounds of salt a year, the variation depending largely upon the amount of natural salts contained in the feed given. This would mean that she should have from two to three pounds during the summer. It would be well to weigh out the amount that the whole flock should have during the summer upon this basis, then there would be no danger of giving too little. It is a mistake to give sheep salt only occasionally and in large quantities, for under these conditions their appetites are so sharpened for it that they eat too much. If it is kept constantly before them where they can eat it at will, they will eat what is necessary for the carrying on of bodily functions, and will not take too much at once.—The New Zealand Farmer.

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To Keep Pigs Healthy.

It is well known that pigs are the healthiest and do best when given plenty of exercise, and kept in sanitary surroundings. The pig in a state of nature is a clean animal, feeding on grass and herbs, and having his lair in some secluded, well-drained spot. He also is careful about his domestic habits—a strange contrast to the degraded ent owners.

Ensilage alone is not a good milk-producer. It is not rich enough in protein, to furnish the solids of the milk. It is an excellent succulent basis for providing a balanced ration, and giving bulk. Maize ensilage has approximately a nutritive ratio of 1 : 11—i.e., one part of protein to 11 parts of carbo-hydrates. An ideal balanced ration should contain one part of protein to five or six parts of carbo-hydrates. Hence it is necessary to add other foods rich in protein, such as bran, lucerne, etc.

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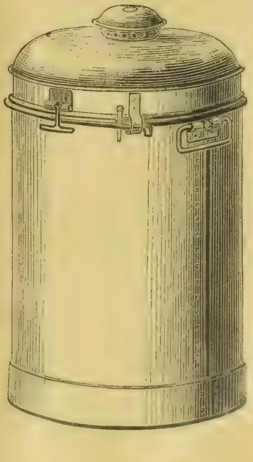

Treatment of Seed Wheat for Smut or Bunt.

(Continued from May issue).

It has been calculated that in a single bunt ball, no larger than a grain of wheat, there are about 4,000,000 spores, each of which is capable of causing one wheat plant to be smutted. In a bushel of wheat there are 600,000 to 1,000,000 grains. There are, therefore, in a single bunt ball, enough spores, if regularly and evenly distributed, to provide each grain in a bushel of wheat with from four to six spores. The great necessity for removing or breaking the bunt balls, so that the fungicide can act upon their contents, is obvious.

It is easier to remove the bunt balls than to ensure that all are broken, and, fortunately, this can be done in most cases without any great difficulty. Bunt balls are lighter than wheat and float in the water, so that if the wheat to be treated is poured slowly into the "pickle," and in such a way that the bunt balls will not be carried down by the grain, they will float on the top, and can be skimmed off and destroyed. As a further precaution, and in order to release any bunt balls which may have been carried down by the grain, the grain should be stirred or raked; this is also likely to break up any partially broken bunt balls which have sunk and become soft.

Until bunt-resisting varieties have been produced, and are in general cultivation, to ensure clean crops it is advisable to assume that all seed is more or less smutty, and requires to be "pickled," for, seeing that the spores are so minute, it is quite possible for enough to be present on the seed grain to cause considerable smut in the resulting crop, and yet for their presence to escape notice.

— The Bluestone Treatment. —

The most popular fungicide for treating seed grain, and the one in most general use, is bluestone (copper sulphate). The efficacy of this fungicide depends upon bringing the "smut" spores in contact with a solution of bluestone for a sufficient length of time to destroy their vitality. Various plans are adopted for attaining this object. Whatever method is adopted, it should be done with sufficient thoroughness to ensure that no spores escape coming into contact with the fungicide long enough to destroy their vitality. A weak solution requires a relatively longer time to destroy the spores than a strong one does. At one time it was the common practice to "steep" the seed in a weak solution (½ per cent.) for twelve hours, but this method has now been almost superseded by methods which require the seed to be "steeped" for a few minutes—three to five—in a stronger solution of, say, 2 per cent.

Bluestone when used alone, and not in combination with lime or lime water, very injuriously affects the germinating power of the seed. Under some conditions, as much as half the seed treated is destroyed, or the vigour of the resulting plants so weakened that they are practically valueless. The ill effects can be almost entirely prevented by sprinkling the treated seed whilst wet with air-slacked lime or wood ashes, or by immersing it for a few minutes in lime water. Lime water is made by mixing freshly burnt (lumpy) lime in water, say, 2lb. of unslacked lime in 20 gallons of water. If freshly burnt lime is not available, the seed should be sprinkled with air-slacked lime or wood ashes. Air-slacked lime is not soluble in water, and therefore lime water cannot be made by mixing air-slacked lime and water together.

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Machinery and science in farming have released the successful farmer of to-day to a large extent from the thraldom and drudgery of labour.

Breeding for an Object.

Thousands of horses are brought into existence without any definite idea on the part of the breeder as to the market requirements they are to meet. This conviction is based upon three considerations: First, the very evident fact that an inordinate proportion are fitted for no special market class, indicating that a large number of farmers are not acquainted with the market classes that have been established by the trade. Second, the glaring defects that are passed unnoticed by the owners. Third, the fact that the average horseman is vastly better acquainted with the blemishes of horses than he is with the proper type and characteristics that go with the different use to which the horse is put. These three reasons are sufficient to account for the production of a mass of inferior animals which do not meet the eye of the critic until they are offered for sale.

Dealers by long experience and constant observation have learned to a nicety all the requirements of a horse, and in their minds clear-cut ideas exist as to what he should or should not be. If these ideas could be clearly established in the minds of the breeders of horses, as they are in those of the buyers, we should have fewer worthless animals produced. For one thing there is too much mixing of blood. It is not at all an uncommon thing to detect in the same horse traces of three or four breeds, representing as many distinct classes of horses.

The expense of growing a horse that nobody wants does not differ from that of producing one that fills the real need, and fills it so well that the prospective buyer is ready to pay good money for it. The difference is not so much in the added expense for the sire as it is in the minds of the men who do the breeding. As with cattle, or with any other farm stock, if the breeder has in advance a clear-cut idea of what he proposes to secure, and uses good judgment in the selection of his sire, in nine cases out of 10 he will succeed. If, however, he undertakes to produce as highly organised an animal as the horse without definite plans in mind, in nine cases out of 10 he will fail.—"Farmer and Grazier."

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Wet or Dry Milking.

The question of whether cows should be milked with wet or dry hands gives rise to a great deal of discussion at times. Many persons who have not a practical acquaintance with the art of milking dogmatically assert that the hands should not even be moistened while the cow is being milked. It is, therefore, somewhat refreshing to find that an authority on dairying practices, Mr. G. S. Thomson, Queensland Government dairy expert, is a supporter of the ordindary practice of milking, of course insisting at the same time on due regard being paid to cleanliness. "Dry milking," says Mr. Thomson, in "The Dairying Industry," "is a strong point with some teachers of dairying, but it is open to objections. It does not seem to be clear, however, what is meant by the term dry milking. Assuming that it implies that the hands must be kept dry, then it cannot be recognised as a safe operation, as it involves danger and injury to cows of a nervous and irritable disposition. It is known that milkers object to animals of the smaller breeds owing to the shortness of the teats, and when difficulty arises in milking with the hands moistened, increased irritation to the cow must result from the 'modern' dry practice. It must be asked how many men and women can milk with dry hands with comfort to the cow and profit to the farm? I am afraid the number is small, and the training of the children (who in many instances do the bulk of the work) would entail considerable trouble. An attendant danger, and one of vital importance in dairying, is efficient stripping of the cow, and I question if the average dry milker has the activity left in his hands to finish this duty in a thorough manner. The nearest approach to the sucking of the calk is the most natural course to pursue, and one that is most appreciated by the cow; but when animals resent their milker, the result of slow, rough, and imperfect milking, at a time when the greatest care and handling is necessary, hurtful consequences will follow; and, further, the old practice will be strengthened if we accept the theory that milk formation is going on in the udder of the cow at the time of milking."

The practice of wet milking has been vigorously condemned because of the neglect of many milkers to adopt precautions to prevent contamination of the milk with dirt and microbe life. "But," says Mr. Thomson, "does not dry milking cause the fall of particles of dirt and scale from the teats and udder in the milk equally as much as wet milking, if there is any neglect in having the udder and flank of the cow perfectly clean? The habit of dipping the fingers into the milk pail, and having the hands dripping with milk, should be strictly forbidden by the farmer. Keeping the hands moist during milking is the most desirable course to follow, and, with other points attended to, the milk should be free from foreign matter. . . . At dairies in this State where the following rules are adhered to I have made repeated examinations of the choice butter manufactured, and can testify to the high standard of excellence, and freedom from injurious organisms and unwelcome flavours :—1, Have cows milked in a clean and sanitary place. 2. The milker should be clean in person. 3. Brush the udder of the cow. 4. Wash the teats and dry them. 5. Damp the udder and flanks of the cow with a cloth. 6. Moisten the hands at intervals with clean water.

"There is no need for washing the udder of the cow unless mud is adherent to the hairs and skin, but it is essential for each milker to be provided with sufficient water to allow of the teats of every cow being washed in a separate supply, and not as we usually find, a little in a basin used for the whole herd. It is from such neglect as this that so much harm arises. Every milker ought not only to study the importance of successful milking, but should keep continuously in mind that want of cleanliness is responsible for many of the worries of the butter or cheese maker and milk consumer, and losses to our factories and to the industry. It is into the milking pail that many of the seeds of contamination are thoughtlessly and carelessly admitted."

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Jerusalem Artichoke for Pigs.

In the course of an experiment to determine the food value of artichokes, for pig feeding, it was found that six thrifty pigs—which had been running on wheat stubble and which weighed from 117 to 215 pounds at the beginning of the experiment—from October 22 to December 11 fed on artichokes, supplemented by a small ration of equal parts of chopped wheat and oats consumed the artichokes grown on one-eighth acre and made a total gain in live weight of 244 pounds, or an average daily gain per pig of 0.81 pound. The pigs consumed during the period 756 pounds of grain, or at the rate of 3.1 pounds of grain for each pound of gain in live weight. In other experiments it had been found that it requires about 5 pounds mixed grain for each pound of gain in live weight. On this basis the feeding of the artichokes resulted in a saving of nearly 2 pounds of grain for each pound of gain in live weight. The pigs were healthy and vigorous throughout the experiment.

The artichokes used in this experiment were planted on ground ploughed deeply and prepared as we would prepare ground for potatoes. The tubers were planted in furrows, which were 3 feet apart. The seed was dropped 18 inches apart in the row and covered with a hoe. The plants were cultivated a few times, but after the tops were 2 feet high no further cultivation was necessary. The tops grew 7 feet high before the end of the season.

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The Dairy Herd From Common Stock.

The following article, written by Professor Thomas Shaw, for The American Agriculturist, may prove of interest to some of our readers :—

When developing the dairy herd from common stock it is not necessary to go to great expense, but a few years of time are necessary in which to accomplish this. The amount of time called for will to some extent be dependent on the character of the stock, that is, the foundation stock, at the outset, and to some extent on the closeness of the culling or selection that is practised. In some instances a fine dairy herd may be built up in two or three generations of correct breeding. In other instances a longer time may be requird ; but it should not require more than four or five generations of proper breeding, in any event, to effect the changes sought. A great change in the line of improvement desired should result from the first cross made.

The plan to be followed is in outline as follows : Begin with such females as can be got conveniently without greater cost than may be termed common prices such as are usually paid for common stock. Give the preference to those that have indications of a reasonable amount of milk-giving capacity. Mate with these a pure sire of one of the dairy breeds with proper form and breeding. Retain all the female progeny for future breeding that have been found to possess the milk-giving quality in a high degree. Discard those of the opposite class as soon as their deficiency becomes known. Continue the same line of breeding until the excellence sought has been reached, or at least continue it until the standard of milk-giving in the cows has come up to the average of the herd from which the sires have been chosen.

— The Formation of Females. —

In one sense it would be correct to say that a good dairy herd may be built up from any class of females that are sound and healthy. While that is true, it is also true that to begin such change on high grades of a beef foundation will take a longer time to produce good dairy cattle than if the foundation were common females of mixed breeding, but already possessed of milk-giving qualities in a considerable degree. Mixed breeding is no detriment in such a case.

First, look for a cow with a large, long, and capacious barrel, open and rather widely-spaced in the ribs, which should spring well downward. Second, look for evidences of refinement as seen in a head inclining to long, a neck long and slim, crops somewhat sharp, and limbs inclining to fine. Third, look for the present evidences of good milk-giving capacity. Fourth, look for evidences of stamina, as indicated by good width through the lower part of the chest, by an active carriage, and a bright, full eye. Fifth, prefer the cow that has a nice soft-handling hide and silky coat.

Choose sires from that dairy breed which may be preferred. The straight dairy breeds that stand in the front in this country are the Holstein, Ayrshire, Guernsey, and Jersey, named probably in the order of relative size. The Dutch Belted cattle not very numerous, are much like the Holstein. The choice being made, don't change the breed from which the sire is chosen, and exercise great care in choosing the sire.

The individual points of a good dairy sire cannot be given in detail here, but two of these will be mentioned, because they are in a sense indispensibfe. The first is, the evidences of much stamina and bodily vigour. The second is, an amplitude of soft skin on the underline in front of the testicles, distinctly traceable milk veins, and miniature teats of good size and wide spacing.

The performance of the ancestry of the bull should be examined. The more good performers in the upward line of his ancestry the better. Good performance on the part of ancestral dams means the giving of large quantities of milk, rich in quality, and persistence in milk-giving for a long period.

The successive sires should be chosen from the same breed. If chosen from another breed disturbing factors are brought in. This may not be apparent at the first, but it will be later. The antagonism likely to result cannot be explained here. By adhering to the same line of breeding the improvement should be rapid and continuous, at least for several generations, but the improvement will be less noticeable with each succeeding generation.

— Continued Selection. —

No matter what the line of breeding, where a high standard in dairy qualities is to be reached and maintained, there must be culling and discarding with every generation. Evidences of physical inferiority are sometimes so apparent at birth that the decision to discard such specimens may be made forthwith. As soon as it is known that the animals fall below the standard, the eye should not pity nor the hand spare. They should be sent to the shambles by a shortcut at the earliest possible moment.

— The Standard to Set. —

Every man will, of course set his own standard. If he fails to set a standard he is not likely to reach high attainment in his work. Breeds differ in their capacity to produce milk, hence high grades of these will also differ. With no breed of dairy cattle or their grades, however, should the standard be set at less then 6,000 pounds of milk per year, old and young. This is probably more than twice the amount produced by the average herd in the United States to-day.

The animals thus grown must be properly fed to have them grow into high type dairy cows. They must be fed upon such food as will keep them in a sappy and growthy condition until maturity is reached. They must not be made fat, nor should they ever be lean.

— Simplicity of the System. —

The system outlined is very simple and inexpensive. The man who wants to get better dairy stock does not require to expend one dollar extra in the purchase of cows. Let him begin with such as he has. There will be some expense in getting a bull, but if he is unable to bear it alone, let some neighbours help him to purchase it, or if not, let them patronize his sire by sending their cows for service at a reasonable price. It will not answer the same purpose to get a grade bull, even though a high grade, for transmission from such an animal is variable.

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Bad Feet in Big Horses.

It is as true to-day as when the saying first gained currency, "No foot, no horse." The importance of good feet need hardly be insisted upon did we not frequently meet with horse-owners who buy without giving due consideration to the subject. Only the most careful of breeders realize that the shape of the foot is largely determined during the first few days of a foal's life. At birth the under-surface is like a yellow cheese, and as impressionable for the first few hours. Standing on a ledge or a stone may give a direction to the whole limb, and cause its continuance by the compression of one part of the foot. An excellent reason for care as to the surface of the ground or the box where mares are foaled down.

The growth of the foot should be the constant care of the breeder, while the foal is running with his dam, and not relegated to the period when, perforce, he must visit the blacksmith. A timely use of the rasp during the first few months of the animal's life, a little paring here or there, may save a turned-out fetlock and an awkward gait, which will influence the horse for life, says a writer in "The Live Stock Journal."

The writer does not advocate plates for normal feet, and would wish, if possible, to do without them when sending to foal shows; but there are circumstances in which they are necessary evils. The necessity for fixing them has at least the advantage of early training in "giving" the feet to be handled, and presupposes the use of the halter and obedience to man, this essential part of a colt's education being too generally neglected until the time of breaking, when the intelligent and the stupid are alike expected to learn a great many things in a very short time.

If a youngster's feet are seen to be thin of hoof and weak at the coronet, he should have special care, such as stimulation of the coronet with any simple preparations, such as white oils or soap liniment, from time to time. With a weak adult foot we can only stimulate it to do its best, but with a colt's foot we may actually increase the horn-secreting papillae in size and functional activity, thereby conferring lasting benefit. In choosing winter quarters for colts we may be restricted by the holding; but where it is possible, the low, weak-heeled subject should be placed upon a limestone and hard soil, and a donkey-footed colt put on rich low-land pasture, for this is the application of natural principles; the Flemish horse has a flat foot and the mountain pony an upright one, and both are brought about by conditions of soil and climate.

We know some astute dealers who buy in districts of a quite opposite character from their own, and place out two- and three-year-olds under conditions calculated to bring about the results above outlined. In this way the size and weight are obtained from one place, and the good feet from another.

When the shelly or brittle foot is observed before the colt has been shod or worked, it is more than likely that the fault is in the digestive organs, or else in the nature of the food supplied. The intimate connection between the horn of the feet, the skin of the animal, and the lining of the alimentary canal is not so generally known as it should be, and our efforts to build good feet are often best directed when we prescribe a more liberal diet and one in which the elements of horn are abundant.

Gelatinous foods, of which linseed stands at the head for horses, are calculated to supply the binding-material that is wanting in a brittle hoof; but there must be power of appropriation, which may be aided by such things as calumba, potash, soda, or dilute mineral acids, which enable the stomach to better deal with the food. The robbery committed by worm may be at the root of shelly feet. The intimacy between the skin and digestion is recognized in a practical way by most men, for they readily associate a hidebound condition with worms, but do not carry the comparison to the feet.

The feet of yearlings and two-year-olds prosper best when wintered out, and it is easily understood, because the yarded animals must either be on soft bedding, which does nothing to harden the under-surface, or else upon ground previously soaked with urine and dung. More often than not the yard is saturated with rain and decaying straw and droppings. The top of it may look fair, but underneath it is in a state of fermentation and decidedly injurious to the horn, particularly the frogs, which in early life are very susceptible.

The difference of opinion among practical men as to the desirability or otherwise of keeping young stock out during winter probably arises from the fact that the men who turn away are more inclined to take trouble than those who will keep colts near to the stack-yard. Provided the youngsters get sufficient food carried to them in the bad season they gain in constitution or stamina, grow sounder feet, and are less liable to grease and some other ailments. If merely turned away and "counted" from a distance, to ascertain that the number is correct, there will be hard times for them when snow or other things make extra demands upon their soft flesh. The colt that is never allowed to lose his foal-flesh will not be likely to have bad feet, and there is no economy in leaving young horse stock to shift for themselves. Giving them constitution by exposure to the elements is not the same thing at all.

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The old milk-straining cloth should not be used over and over, unless it is cleaned every day by being boiled.

Selecting a Dairy Cow.

There are many farmers who are born judges of stock, and who appear to have an intuitive perception of the milking properties of the various cattle which they examine. No man, however, has yet been able to determine by any form of examination of the animal whether she is a producer of rich milk. Practically everyone knows that the cattle of the Channel Island breeds produce richer milk than the cattle of other varieties, and that cows possessing the blood of these cattle are in most cases richer milkers than others; but if a dozen Shorthorns are ranged side by side, the most skilful judge would be unable to determine from an inspection which cows produced the richest milk. In the ordinary way, the farmer seeks for quantity of milk, and as we have observed, he is often a good judge as to which cows produce the most. But there is an equally important point; it is essential that a cow should not only milk well when she had calved, but that she should continue to milk well until she is dried off for calving again, and here many deep milkers fail, for though they produce a large volume of milk for two or three months, they then rapidly fall off.

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The Soil as a Savings Bank.

Any crop that leaves the soil in good condition will cost less than one which apparently pays better, but which largely draws upon the soil for plant food. Ordinary wheat straw takes more fertility from the soil than potatoes, if compared by weight, because the potato is composed more largely of starch and water. The soil should not be considered as a source of food for plants; but rather as a location for growth, the food for the plants to be provided by the farmer according to the requirements of the crop. No crop pays that leaves the soil poorer, unless sold at a price which will enable the farmer to restore the plant food, and also receive a fair profit for his time and labour. The soil is the storehouse of the farm on which is stored the raw materials for future crops, and the real wealth of the farm is in its soil, as it can be drawn upon in the future for crops that may be in demand. Whether a farmer receives a large return or fails altogether during any year, he has the soil as a savings bank, representing much of that which has been applied to it previously. Too often is a field of the smaller grains grown without a seeding of clover or grass seed. Because a field is to be ploughed the following fall or spring it is a mistake to suppose that what growth the grass could make would not pay for the seed. One season's growth of clover will often furnish a ton an acre to be ploughed under.—Exchange.

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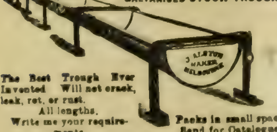

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Seaweed as a Manure.

The use of seaweed as a manure is necessarily confined to within a short distance of the seacoast. The material is very bulky and watery (containing from 70 to 90 per cent of water), and consequently can not be profitably transported to a great distance. It is undoubtedly an economical practice to allow the seaweed to partially dry on the beach before carting it to the land. It is, however, not advisable to allow the material to dry out so thoroughly that it will not readily decompose in the soil or to subject it to any considerable amount of fermentation or leaching, as in this case a large proportion of its valuable constituents—nitrogen and potash—will be lost. On account of its bulk and watery condition it is necessary to apply seaweed in very large amounts, 20 to 30 tons per acre, in order to supply sufficient amounts of nitrogen, phosphoric acid, and potash for the needs of crops.

Seaweed in the moist state contains about 0.4 per cent. of nitrogen, 0.7 per cent. of potash, and less than 0.1 per cent. of phosphoric acid.

The potash of seaweed, which is probably its most important fertilizing constituent, is subject to wide variation. Fresh seaweed often contains 1 per cent and more of this constituent, but it is soluble and is rapidly lost if the weed is subjected to washing. The lime is also very variable, owing to the adherence of shells, etc., but normally it is probably less than 1 per cent.

Seaweed belongs to the same class of manures as barnyard manure and green manures. At the same time that it furnishes more or less of all the constituents required by plants, it supplies the soil with a large amount of humus to improve its physiral properties. For this reason it proves especially valuable on porous, sandy soils. It differs from average barnyard manure in its higher percentage of potash and lower percentage of phosphoric acid. While, like barnyard manure, it is a general fertilizer, it is not so well balanced, and its continued use without the addition of other fertilizers is likely to result in a one-sided exhaustion of the soil. In order to prevent a deficiency of phosphoric acid as compared with the other fertilizing constituents and an undue draft on this element in the soil, it is necessary to apply seaweed in very large amounts, thus furnishing nitrogen and potash far in excess of the needs of the crop and subjecting them to danger of loss. To get the best results seaweed should undoubtedly be used in connection with bone or other phosphate.

Since seaweed contains a considerable amount of potash which is largely soluble in water, it is correctly considered a potassic manure and especially valuable for soils deficient in potash and crops like potatoes, clover, etc., which are potash feeders.

The nitrogen of seaweed is in organic form, and is therefore not available to plants until decomposition and nitrification have taken place. With the majority of seaweeds, however, this rapidly occurs in the soil, and it is not considered necessary, as a rule, to ferment the weed before applying it to the soil. It may be applied fresh as a top-dressing (on grass) or may be ploughed in. On account of its rapid decomposition seaweed furnishes a valuable means of starting fermentation in manure, compost heaps, peat, etc. These statements apply especially to the more succulent and mucilaginous kinds of seaweed.

Seaweed has been extensively used as a fertilizer for potatoes, especially in Scotland and the eastern seaboard of U.S.A. It is claimed, however, that the quality of the tubers is impaired if the weed is applied in the spring or at time of planting. This is probably due to the chlorin which the seaweed contains in considerable amounts, it being a well-known fact that chlorin in large amounts in the soil has a tendency to lower the starch content of potatoes, and thus injure their quality. In any case the seaweed should be given sufficient time to decay in the soil before plant- to early potatoes. Seaweed alone and made in Scotland, seaweed was compared with barnyard manure and commercial fertilizers applied in the spring to early potataes. Seaweed alone and barnyard manure alone were about equally effective in increasing the yield. Seaweed combined with superphosphate gave a larger yield than manure alone or manure with superphosphate. The potatoes grown with manure, however, were of better quality than those grown with seaweed. The potatoes grown with seaweed were apparently more immature and deficient in starch than those grown with the manure. It is suggested that the seaweed prolonged the period of growth and would have given better results with late potatoes.

It has been observed that seaweed applied at the time of planting tends to decrease scab in potatoes. In this respect it possesses a decided advantage over barnyard manure which is known to favor the development of scab. Another advantage which seaweed possesses is its freedom from weed seeds, eggs of insects, and germs or spores of plant diseases.

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There is no other branch of agriculture which builds up the farm while furnishing the market with an essential product like the dairy cow.

Too much care cannot be taken in the selection of the head of the herd. The difference between a really good bull and one of ordinary value is not to be counted in pounds when the purchase is made.

The cow absorbs the raw products of the farm, and converts them into a form which is becoming more and more necessary every year, and, at the same time, she returns to the field a large percentage of the original product, in the form of manure.

Farm Notes for July.

If every farmer in this State were to establish a goodly number of forest trees on his holding there would, within a few years, be a wonderful transformation in the appearance of the country; and probably a great improvement in our climatic conditions. The thinnings will be useful for firewood, and in time there will be timber for a hundred different uses. Trees should be protected absolutely against trespassing stock, and should be in clumps of not less than 50 at 3 ft. apart, or planted in several rows, say in rows at 8 ft. apart each way. They will "rob" the soil to a distance of 50 ft. at least when they are 20 ft. high, but the shelter to crops will give an increase that will amply compensate for the land occupied by the trees.

Good health and a cheerful active disposition cannot be maintained for a long time without proper food, and the proper food for human beings must include vegetables and fruit. In many places the hawkers' carts and little stores seldom have anything of this sort that is not dear and of very poor quality. The farmer can set apart a couple of acres of good soil, properly enclose it, heavily manure and deeply cultivate it with aid of the farm animals and implements. On this area he can grow vines, certain fruit trees suited to the locality, and sufficient spring and summer vegetables to supply at least his own household. Very many people are in the habit of growing large beds of one kind of vegetable, which all comes in at once, in place of sowing very small lots fortnightly, and thus keeping up the supply.

Sow seeds of mangolds and beets on well tilled and heavily manured land. If the soil is brackish it will be all the better for the crop. On rather shallow soils—of course not too dry—the Globe and other short varieties will do best; on rich, deep, rather moist alluvium the Long Red and Mammoth sorts will do. Sugar beets will also be well suited for the shallower soils. The crop must be grown in drills 2 ft. x 1 ft. 6 in. for sugar beets, and 2 ft. 6 in. x 1 ft. 6 in. for mangolds. When the plants are growing they must be reduced to one plant in each spot, as the seed capsules usually contain more than one seed. If removed early enough, without injury to the tap-root, they may be re-planted where gaps exist, but the tap-root must not be twisted or bent.

Sow some rape and white mustard on rich, deep, well tilled soil by preference, but anyhow sow it, even on ordinary well-prepared land. The crop can be fed off or turned into silage. Peas sown in drills 3 ft. apart will give a nice lot of seed for pigs and fowls, and the haulms will serve as food for other live stock. It would be well to sow a little Tartarian oats, or some barley, in the drills to serve as support for the peas. If mustard is sown for seed the drills should be 6 ft. apart. Rich sandy soil is best for this crop. Turnips for sheep may be sown in drills 2 ft. apart. Carrots and parsnips for horses and cows, sow thinly in drills 18 in. apart, thin to 12 in. in the rows, and frequently cultivate with the hoe. Sunflowers will grow on brackish soil, and, in addition to the seeds, the leaves are of value for feeding stock.

Plant potatoes in light, rich, friable soil, in rows 30 in. by 15 in. apart, and keep the ground cultivated till the crop is ready to harvest.

Plant out all cattle cabbages, kails, etc., and gave each variety plenty of room in which to grow. The richer the soil (in reason) the better for the crop.

Land should be manured and got ready for maize, sorghums, millets, and other summer-growing crops. These must be sown in drills, and must be cultivated several times whilst growing. It is of little use trying to produce such crops on heavy, dry, clay soils, or to do without the frequent cultivation between the drills.

In breeding any kind of animal there can never be a mistake by using the most perfect and pure-bred male. A mongrel or a half-bred male cannot improve his progeny; but if a pure-bred animal is put with an inferior female, there will be every possibility that the progeny will be superior to the mother.

Lucern should be tried wherever the soil is fairly deep, rich, and light. It will thrive even in saline soils. Land should be prepared now, but seed should not be sown until danger of night frosts catching the young plants is part. When the lucern is established frost will not injure it.

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Shelter Belts.

In advocating the more general planting of timber for shelter "The Leader" in a recent article points out that experience of late years has shown that the starting of seeds for this purpose in a nursery with subsequent transplanting and its attendant possibilities of loss, is unnecessary and continues "Probably the most successful growers of timber belts are those to be found throughout that section of country called the Western plains, the cold, bleak character of which in the winter render timber belt planting an imperative necessity, and here the most successful growers have discarded the dibbling system in favor of broadcasting. The planting season is from now to well on in August. The practice used to be ploughing well in advance of planting, but now it is found best to defer the ploughing to immediately before sowing the seed. The land intended to be planted is ploughed to a fair depth, according to what the depth of surface soil will stand, and then finely worked down as nearly as possible to garden tilth. The seed is sown broadcast by hand (mixed with fine sand to facilitate sowing) and covered with a brush harrow.

"The young plants are thinned out at the end of the first year, and in the second and third years other thinnings are made; selecting the straightest and best of the young trees so as to leave them at an average distance of 10 feet apart. When a new belt is first planted it is fenced off from the stock with a cheap but effective wire fence for from three to four years, when the fencing is then removed for use in new belts. At one time the blue gum was the main variety used, but of late years the sugar gum has been found by far the best, alike for beauty of appearance and because the foliage comes nearer the ground for shelter. In this latter connection also a mixture of acacia seed with the sugar gum is found beneficial. The earlier plantations of sugar gum now supply most of the Western plains growers with their own seed, as well as with a surplus for sale."

One of the most successful planters of timber belts supplies our contemporary with the following note:—"Upon the first year depends the future of a plantation, because if a good seed germination is obtained, so that the tap root obtains a good, firm hold of the subsoil and the trees are protected from the stock, during the early three or four years they grow into good timber, if annually thinned out to admit of proper development. As to kinds and quantity of seed, say a timber belt two miles long by one chain wide, with two acres round the homestead, may be taken as an example. This would amount altogether to 18 acres, and would require 2 ℔. sugar gum, 1 ℔. Pinus insignis, ¼ ℔. lemon gum, ¼ ℔. red gum, ½ ℔. Cootamundra wattle, ½ ℔. golden wattle, ½ ℔. silver wattle and ½ ℔. black wattle. For sowing, the seeds are all mixed together, and then further mixed with sand, ashes or similar dry substance to facilitate the broadcasting by hand and promote an even distribution of the seed. A calm day is selected for sowing, and after the sowing a light brush harrow (small branches of trees tied together on a bar about 10 or 12 feet long) is drawn over the ground once only, and for choice it is found better to sow the seed when the ground is fairly dry."

The Louvre.

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THE LOUVRE.

Mineral Oils and Lubrication.

Abstracted from a paper on the "Natural History of some of the leading Oils of Commerce," read by Mr. J. Veitch Wilson before the Coventry Engineering Society.

It has often been observed as something of an anomaly that in the case of engines working under apparently similar conditions of temperature and pressure, the older lubricants were used with satisfaction and without damage, while in others continual trouble was experienced. In part this was explained by the construction of the engines themselves, for it was found that the engine had a free and easy exhaust and swept out the used oil with each stroke with no damage, while if the exhaust arrangements permitted the oil to accumulate in the cylinder there was trouble. Thus, in engines with the exhaust ports on the lower side of the cylinder, fatty oils were used with satisfaction and with immunity from trouble. But in the case of engines exhausting on the upper side, and especially when the exhaust was through a vertical pipe, the cylinders were filled with deposits, and piston rings, the cylinder itself, and the bolts and nuts were corroded. Mineral oils, even in their imperfect condition, prevented the fatty oil from coagulating, and by promoting their discharge from the cylinders reduced, if they did not entirely overcome, their injurious effects. It must be borne in mind also, as an important factor in dealing with this aspect of the question, that the conversion of neutral fats into their corresponding acids is not an instantaneous action either when undertaken purposely in manufacturing operations, or when it occurs incidentally in a steam cylinder. Neither is the action of the liberated acids upon metal an affair of moments. It follows from this, therefore, that damage to cylinders is not necessarily and solely to be attributed to the lubricants, but may be due in a large measure to the construction of the engine, which promotes the formation of deposits and gives them time to perform their deadly work.

I have had several striking examples of this, but one or two may suffice to justify my argument. Friends of mine in the North had a large horizontal compound engine working in connection with a surface condenser, and were much troubled with heavy deposits in the low pressure cylinder. I was asked to have a look at it, and when I did so I found a vertical pipe 4 or 5 inches in diameter rising from the low pressure cylinder and terminating in a large iron box fixed above the engine. On asking what this arrangement was, I was told that the box was an oil separator, and was filled with chains to arrest the oil before it reached the condenser on its way to the boiler. When I had grasped the circumstances I suggested that they might have saved the expense of the chain box, as the tall vertical pipe seemed to be performing all the duties of a separator by catching the oil, and was, moreover, acting as an economiser by returning the oil to the cylinder, to be used over and over again till it was converted into pitch. Another example. In this case a double acting horizontal cylinder, about 4 feet in diameter, was used on an air pump to maintain a vacuum in certain pans used in manufacturing operations. The exhaust was by a vertical pipe 6 or 8 inches in diameter and 12 or 15 feet in height, rising through the roof, and delivering in a silencing chamber. The valves at the bottom of the pipe got choked with deposits of oil, and they wondered where it came from. I thought that I knew, but I leave you to divine its origin for yourselves.

So much for the mechanical aspect of the question which, bearing in mind the old adage, "Prevention is better than cure," applies equally to fatty and to mineral oils, for although the latter are not liable to produce fatty acids to the detriment of the cylinders, they may yet form troublesome deposits if means are not taken to remove them from the cylinders when they have done their work.

Assuming that this difficulty has been disposed of, we may for a few moments consider the relative merits of "fatty" and of "hydrocarbon" lubricants for steam cylinders.

I am sorry to say that although engineers, chemists, mathematicians and other scientific men have given much attention to friction on ordinary bearings and faces, very little attention has been devoted to internal friction in the presence of steam. I have seen one or two testing machines for cylinder oil, but these were simply ordinary bearings to which heat was applied by a lamp underneath. Evidently steam and the important conditions which it introduces were absent. The only practical apparatus which I have heard of for testing cylinder oil in the presence of steam is one in use in the Hoboken Institute in New Jersey. The particulars which I give you of this machine are taken from a paper read before the American Society of Mechanical Engineers by Professor James F. Denton some twenty years ago. This machine consisted essentially of a working steam cylinder fitted with an abnormally long piston. This piston had at each end a steam tight

C. H. LEHMANN

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STRAPS.—Saddle Straps from 6/, doz.; Hobble Straps, 9d. 1/, each. Rings, 4d. 6d. good quality.

REINS, Single Cart, strong, 7/6, 8/6; Spring Cart 7/6, 8/6; Leading, 11/6 for 25 feet, 16/ for 36 feet; Cross Reins, strong, Waggon, 12/6, 13/6; Cross Reins, Buggy, Silver Buckles, best 14/6, 15/6. For folded hand parts add 6/ Bridle Reims, 2/6; Silver Buckles, 3/6.

HARNESS.—Carriage Harness for £15 up Best. Pair Horse, with pads, from £10 up. Pair Horse Ordinary Skeleton, Traces sewn in Hames, 120/. including Pole Straps; with Buckles in Hames, £6 10/, £7, £8, £9 Single Buggy or Trap Harness, you can have as low as £4 10, but if you are wise don't go below £6, £6 10, £6 15, £7, £8, £9, £10, £11, £12. Best Value, and really a splendid line is £8. Spring Cart, with Square Saddle, £5 10/., £6, £6 10/, £7. Long Saddles, 5/ extra.

CART or DRAY HARNESS. Saddles 22/6, 25/ and 27/6; Breeching same price, 22/6, 25/- and 27/6; Shaft Belly Bands, 6/6, 7/6; Leading Belly-Bands, 3/, 3/6; Iron-cased Hames, 5/6, 6 6, 7/6, 8/6. (Really Good); Hame Straps 9/ per doz., or 10d. each; Cart Winkers, 8/6, 9 6; Patent, 10/6; Queensland Pattern, 11/6, Plough Backbands, 5/6, 6/6, Spiders, 7/6, 8/6;9/6; Best Chains, 5d. 6d. lb.

COLLARS.—Faced with Hair, Best, 17/, and 18/; Leather Lining, 19/, 20/ Round, 17/; Faced with Hair, 18/; Spring Cart, 17/; Patent Leather, 20/, 22/6; Yankee Chaff 17/, 19/, 20/.

KANGAROO THONGS, good 1¼ yard, 1/; 1½ yard, 1/4; 1¾ yard, 1/8; 2 yards, 2/. 6 plait, 8 x 8, Stock Thongs, 6/6, 7/6, 8/6;

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ring. Midway between these rings a third ring was carried on two short rocking levers, the inner ends of which were attached to a rod which was free to move up and down within the piston rod proper. The friction between the cylinder and the movable ring deflected the latter to a greater or less extent from its normal position, and the amount of this deflection was recorded diagrammatically on a card by means of a pencil attached to the outer end of the indicator rod passing through the piston rod. Had it been possible to run this machine absolutely without friction, the pencil would have gone up and down upon the same line.

In practice, the reciprocating motion of the piston caused the test ring to move up and down, and then described a line on each side of the normal line at a distance varying with the lubricating value of the oil. Professor Denton seems to have confined his attention in his earlier experiments to comparing results without oil with those obtained with different qualities of mineral cylinder oils, and I need hardly tell you that the results uniformly showed the advantage arising from the use of oil.

But although we have no experimental data to fall back upon to guide us in determining the relative merits of "no oil" as compared with "fatty oils" or "mineral oil," or with mixtures of these, we have something better in the practical experience of engineers gained in all manner of conditions in all parts of the country. And the result of that experience amounts, I think, to this, that for vertical engines in which the friction is limited to that arising from the pressure of the rings upon the sides of the cylinder pure hydrocarbon oils are sufficient, but in the case of horizontal engines, in which the weight of the piston becomes a factor, compound oils are generally required.

My attention was originally drawn to this in a striking manner. I had been visiting a number of factories in Dundee, making inquiry in each case regarding their experience with cylinder lubricants. In some I had been told that pure mineral oils were perfectly satisfactory, in others that they were useless, or that they had to be supplemented by liberal additions of fatty oil or tallow. My last information to this effect was given to me as I stood beside a large horizontal engine in which pure mineral oil was used, but my informant told me that every now and then, when "the pair thing begood ti schriech," they had to give it a dose of melted tallow. It then struck me that possibly the condition "vertical" or "horizontal" determined the question of "mineral" or "compound" oil. To settle this I revisited all the works I had already called at, and on further inquiry I found that in each of the cases in which pure mineral oil was satisfactory, the engine was vertical, and that in the cases in which it failed the engines were horizontal. This information was most significant, and has served me as a guide in recommending oils ever since. There is one exception to this rule of recommending compound oils for horizontal engines that occurs when the engines are worked in connection with surface condensers, and as in this case the bulk of the oil used in the cylinders would find its way into the boiler, it is imperative that no fatty oil should be used. This may, in the case of horizontal land engines, entail a slight increase in the coal bill, but in the case of marine engines, which are almost invariably of the vertical type, lubrication is limited to "swabbing" the rods, and no harm seems to accrue except to the oil merchant who is done out of his order.

Essential Points.

In the growth of plants, at their best, certain conditions are essentail. These are:

(1) Suitable water supply to carry to the leaves the foods stored in the soil;

(2) An adequate air or oxygen supply to every living cell of the plant.

(3) An adequate food supply in the soil.

(4) Suitable temperature relations between the plant and its surroundings.

Every effort of tillage should be directed towards surrounding the plant with these essential conditions at their very best. It is evident, therefore, that tillage is an operation that deals with a complex set of factors, viz., air, water, soil temperature, and food supply, and that while the art of tillage is an old one, the science of tillage which deals with the practice of the art is comparatively new.

A Valuable Invention.

A machine which may have an immense influence on the development of Northern Australia has been patented recently in the United States. Tens of thousands of the northern lands of the Commonwealth are admirably adapted for cotton cultivation but high priced white labour in competition with nigger picked stuff, with the possibility of a Mr. Lundie coming along at a critical time has hitherto been an effectual bar to any great extension of the industry. With the machine referred to it is said that one man and team can do the work of forty hand pickers and it is estimated that by its use the cotton growers of the States will save £3,000,000 yearly

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As a preventative to the spread of POTATO BLIGHT (Irish blight) SCAB, BROWN RUST, etc., Immerse all seed potatoes in SICKLE BRAND FORMALIN 1 ℔. to 32 gallons water. Soak uncut tubers in the solution for 2 hours, spread out to dry, cut and plant as usual. It is important not to cut tubers before treatment.

PRICES:

1/6 per 1 ℔. bottle, 14/- per gallon bottle, 12/6 per gal. in 3 gallon jars, 1 gallon — about 11¼ ℔s.

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SOUTH AUSTRALIAN

Poultry and Kennel Club.

GRAND SHOW

NORTHERN ANNEXE.

JUBILEE EXHIBITION GROUNDS.

FRIDAY, JULY 7, 1 p.m. to 10 p.m.

SATURDAY, JULY 8, 10 a.m. to 9 p.m.

Poultry, Pigeons, Canaries, Dogs, Cats, Etc.

ADMISSION 1s., Children Half-Price.

JOSEPH HILL,
Hon. Sec., Pirie Street.

Poultry Notes.

Victorian Poultry and Kennel Club's Show.

A Victorian friend who visited this show very kindly forwards the following note which he rightly thinks may be of interest to fanciers on this side.

"Glad to find that more breeders over your way are waking up to the fact that it is good business to send to our shows. Taken altogether S.A. was represented by quite a nice team. In Dorkings, W. A. Jones, a new man, I suppose, as I do not remember the name as being amongst the old-timers, took both firsts in the the young classes. The cockerel, a fine solid customer, of good colour, whilst the pullet was nice in colour and shapely. Plymouth Rocks made a big show, about forty being penned, quite reminded one of the old days when the beauful Barred had their last run. In quality of barring, however, the old lot were not in it for sharpness and evenness of colour. Sid. Cope represented S.A. in this section but did not score quite as well as I expected after a run round before judging. However, he gathered in a couple of tickets and even V.H.C.'s took some getting in the very hot company, and anyway he did not have the best of luck in my opinion. Orpingtons turned up 120 strong. The blacks and Whites being very good class. We are getting to know the "Wimble" Orpingtons very well on this side. I reckon he will agree with what I have said about its being good business to show over here, for I fancy his Victorian cheques bulk pretty largely in his total yearly sales. He has the goods all right. The cocks were weak but the hens were tip top. F.J.W. only scored a V.H.C. with a bird which might have been higher, but in my opinion his other hen, unnoticed, beat her pointless, and really romped home an easy first in the class. Of course I am not a specialist and Mr. Maude might have been right, but I have my doubts. In cockerels the Adelaide man got home 1st, spl., and second with two very classy youngsters. Hot stuff. Big, broad, and low, with tip top colour. We are very strong in Whites over here so Mr. Wimble figured mostly in the V.H.C.'s, he got several of them. I liked his stuff, especially females, but there is no doubt that Mrs. Rohlk's strain is on top. Taken all round they are whiter, bigger, and better. It was a treat to see Sid Cope's Wyandottes. They are good. Of course we have a few good ones over here, too, so he did not have quite the rosy time he usually gets over in your village. A V.H.C. in silver cocks with a bird not by any means at its top, came his way; but he had a day out in pullets, 1st, spl., 2nd, and 3rd is pretty hot. You mark that third bird, the others are out of the box all right but at her top, No. 3 is my pick. 3rd gold cock, 1st gold hen, with a clinker. V.H.C. white cock and 2nd white hen, a top quality bird, finished his record. In Indian Game your man bumped up against a hard nut in Sam Haynes and the honours certainly went to Samuel. Still 1st cockerel and 3rd pullet went to the Gawler man, J. Morrow, with rattling birds. If you see them at your P. and K. you will like them, especially the cockerel. He is low, broad, and as hard and heavy as a lump of lead. I remember S.A. Malays in the old days and I notice from friend Brown's exhibit that the quality is still O.K. Six firsts out of a possible eight with a second and third in the other classes ought to satisfy W.H.B.

R. J. CHESNEY
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PRACTICAL SHIRTMAKER.
Good fitting garments at prices below imported shirts. A good selection of vest material always in stock. Send for range of patterns.

Port Adelaide Poultry Show.

Some time ago it was said that the Port Adelaide Poultry and Dog Society were not likely to keep going and that a show this year was not likely to come off. We are glad to find that this was a mistake and that their show, the third, will be held on July 27 and 28 at Luxmoore Bros.' wool Store.

Mr. C. B. Coleman, Commercial Road, Port and Torrens Road, Woodville, is the secretary, and we hope fanciers between this and July 15 will keep him pleasantly busy in the matter of receiving entries. Let everyone who can do so lend a helping hand and give the society a strong and long push forward. We understand that the re-juvenation, re-construction, re-generation, re-organisation, etc., of the poultry world, which bulked somewhat largely in the original programme has been dropped and that in future it will attend strictly to business. We wish the society a pleasant show and a long and useful life.

"SARGENFRI" POULTRY YARDS.

PLYMOUTH ROCKS.

American "Ringlet" Strain. Barred to the Skin.

Winnings last year:—8 Firsts, 7 Seconds, 6 Thirds, and 2 Trophies for Best Rock in the Show.

Royal March Show, 1911:—The "Garden & Field" Challenge Cup.

Our Matings this year are better than ever. As we believe the Barred Rock to be the Coming Breed for Show and General Utility, we confidently recommend this line to our friends. Eggs £2 2s. and £1 1s. per doz.

Some Grand Young Stock for Sale.

BLACK ORPINGTONS.

In Black Orpingtons we can offer Eggs from our best pens, in which our noted winning "Sargenfri' King "Sargenfri" Prince blood is well represented, at usual prices, £2 2s. £1 1s. and 10s. 6d. per dozen. High-Class Young Stock.

WHITE LEGHORNS.

We have 400 well-bred young Leghorns ready for Customers. They are birds of good quality, and will turn into healthy, vigorous, heavy-laying stock. (N.B.—"Sargenfri" Leghorns lay standard size eggs every time. Eggs from all Pens 10s. 6d. per dozen,

INDIAN RUNNER DUCKS.

Unbeaten in the Show Ring and Splendid Layers. A Fine lot of Typical Young Stock for Sale. Eggs 10s. 6d. per dozen.

C. J. CHANDLER (Near Glynde Hotel) **East Payneham.**

Making a Correct Start with Poultry.

It is not necessary to build elaborate houses or to have them furnished with the latest patented trap nests, roosts, etc. In point of usefulness, a plain, open-fronted building is all that is necessary. An old orchard is an ideal location for the poultry yard, furnishing shade for the fowls during the hot weather, and the fruit trees are benefited by destroying numerous injurious insects. Face the houses east if possible. Construct the nests and roosts so that they may be removed to facilitate cleaning, and do not place the roosts so high that the fowls are injured in flying down.

To keep the fowls laying it is necessary to feed intelligently and see that they get plenty of exercise. A fat hen will not lay, but if they are compelled to work for their food they will be kept in proper condition. Feed all kinds of grain and vegetables available, aim always to give a variety of food. A mash of grain, cooked vegetables, and table scraps make a good morning meal. In the evening feed grain. Milk is one of the best foods to produce eggs. Grit must be provided at all times, and nothing is better than broken crockery.

Cleanliness is one of the chief requisites of success, so the houses, nests and yards should be cleaned frequently, the houses whitewashed, and insect powder used freely. Clean out the droppings every day, oil the roosts frequently with kerosene, and provide clean material for the nests. If this is done there will be no trouble from lice, but if filth is allowed to accumulate the mites will multiply rapidly and cause no end of trouble. Change nesting material every two weeks, and when putting in the new straw sprinkle it liberally with insect powder. A dirt floor is best for the hen house, and should be raised several inches above the outside level so that it may be kept dry.

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Preparing Poultry for Show.

Many poultry-breeders frequently show their poultry in a ragged, unkempt, or unclean condition, through ignorance or carelessness. With the view of impressing the necessity of giving care and attention to poultry and to explain the rudiments of exhibiting stock that have to come before the critical eye of a judge, the following remarks concerning the preparation of poultry for the show-pen are made :—

First of all critically examine all the likely birds you are possessed of is my advice to would-be exhibitors. If not sufficiently versed in what is expected in show-birds take the advice of a friend better informed than yourself. This selecting is not to be hurriedly done. Especially in young birds great changes in their appearance frequently occur. The discarded bird of to-day may in a few weeks blossom out, and be the pick of the flock. Therefore, keep an open mind in respect to which are the best, and certainly keep in touch with those birds which may be backward, yet promising. When selections are made the birds should be penned in suitable boxes, on grass if possible, until a week or so before a show. These receptacles for holding fowls ought to be shifted every day or two, to give the birds new soil and fresh grass. If regularly fed and watered the birds will improve under the new conditions.

What is to be looked for in a show bird is type first—a long first—then colour, and condition.

A week or two before a show the coming champion should be placed in a roomy pen, similar to what it will have to occupy in a show. Some birds may be wild and flurried ; but, if gently treated, fed lightly, and a light stick used to move it about in a quiet manner, the bird will speedily become confident and tame. The owner should when he visits his birds, take with him a few small pieces of meat, giving one or two to each bird. If fed lightly a bird will look for these choice morsels, and will take them from the owner's hand. When well accustomed to the pen and to handling the bird or birds may be replaced in their accommodation boxes on the grass.

Some birds require washing before being shown. Others only require the shanks, faces, and combs washed. The latter class of birds may have this attention—a necessary one—paid them just before being basketed for the show in which they have to appear.

The washing of white or other delicate-coloured birds is a necessity, and is of considerable importance where close competition is expected. The plumage of a show-bird should be absolutely devoid of all impurity. A white bird, for instance, should be pure white and glossy. The art of washing one's birds is a simple one, yet it must be done so thoroughly that, in addition to the bird being thoroughly cleansed, the plumage must, when dry, be in first-class order.

CYPHER'S INCUBATORS.

The most successful Incubator possibly in the world, and gets the best results from fertile eggs of any Incubator made. All the operator has to do is, put the eggs in, light the lamp, and the machine does the rest. They are the simplest to work, and the cost is reduced to a mimimum.

These Machines took the Gold Medal at St. Louis Exhibition.

Nine of these machines, equalling about 1,820 eggs, are now in use at Roseworthy College.

No. 0 Standard Incubator, 66-egg, £5 5/-.
No. 1 Standard Incubator, 140- egg, £7 15/-
No. 2 Standard Incubator, 240-egg, £10.
No. 3 Standard Incubator, 390-egg, £13 10/-.
Farm Economy, 100-egg, 95/-.
Brooders, £4 4/- and £7 2/6.
Thermometers, Wicks, Burners, etc., always kept in stock.
Catalogue on application.

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SHOPPING CENTRE, RUNDLE STREET AND STEPHENS-PLACE.

R. WARHURST
143, RUNDLE STREET.
(Opposite Foy & Gibsons).
Accordeons, Autoharps, Mouth Organs, Whistles, School Flutes, Violins, Strings, and Fittings.
Pianos and Organs for sale at Cheap Prices.

The Breeding Pen.

A considerable amount of loss is occasioned every year through a percentage of the eggs required for hatching failing to contain a germ, thus rendering them of no use whatever, as by the time their infertility is discovered they have been incubated for at least a week, when they are too stale to sell for edible purposes. Besides the actual waste of the eggs themselves there is a greater loss, namely, the time, because at the beginning of the season, when eggs are exceedingly scarce, every day is of value. During some years the complaints regarding infertility are much more frequent than others. We cannot, of course, altogether prevent a few infertile eggs, but by careful attention to the selection and mating of the breeding stock we can greatly minimise the number. It is often argued that because birds in a wild state practically never lay an infertile egg, therefore there must be something radically wrong with our present day methods of poultry keeping, but it should not be forgotten in this connection that the former lay but one or at the most two nests of eggs in a twelve month, whereas domestic poultry frequently lay upwards of 200 eggs in a similar period. Considering the extra strain which is put upon the birds, both the cocks and the hens, it is remarkable that we do not procure a still larger number of sterile eggs.

The number of birds that compose the breeding pen has a direct bearing upon the fertility, either too few or too many resulting in weak germs or infertile eggs. No definite numbers can be actually stated, because it depends upon so many circumstances. It depends for one thing upon the breed, some being more active than others; it depends upon the conditions under which the birds are kept, whether they have their liberty or are confined; it depends, too, upon the time of year. As a guide the following figures may be taken, but they are merely given as a guide, and are not meant to be rigidly adhered to. Early in the season, a cock of a light breed, such as a Minorca or Leghorn, if kept in a confined run, is able to attend to about ten hens, the number being gradually increased till, towards the close of the breeding season, as many as 16 or even 18 may be successfully mated with one male bird. With the heavy breeds—Orpingtons, Wyandottes—more than half a dozen should not commence the season, increasing to ten or a dozen as the spring advances. When the birds have their liberty about half as many birds again can generally be mated with success as when confined in a limited area.

A frequent cause of infertility is the fat state of the breeding stock. Laying hens should be maintained in a lean, hard condition, and on no account allowed to become fat and flabby, because in the latter case the eggs will not only be more liable to contain no germ, but they will probably be much fewer in number. There is always a tendency during the winter months, when the hens are under cover a good deal and the nights are long, for them to get too fat, and this is a point that must be carefully watched. If the male birds gets too fat he becomes lazy and will not perform his duties in a satisfactory manner. As far as possible, exercise should be encouraged, as nothing helps so much to keep the birds in a good working condition. The fowls composing the breeding pen should be periodically examined, and if they are too fat the food should be reduced, while if, on the other hand, they are too thin the rations should be increased.

WANTED TO SELL.

DORKINGS.—Silver and Coloured and Indian Game low set up-to-date strain. Columbian Wyandottes. Eggs 10/- for 15. Birds from 10/6 each, according to quality. — J. J. GABB, Somerton Prize Poultry Yards, Glenelg, S.A. 8-11.

INCUBATORS AND BROODERS, Simplex, awarded first price (silver medal) Adelaide Exhibition, 1910. Agent for Cort's Patent Cooler-safe, a boon in summer. Send for price list.—D. LANYON, Manufacturer, 46 North Terrace, Kent Town. 6-12.

Danger to Ducks from Free Range.

When the young ducks have been in confinement do not through mistaken kindness give them a day out in the paddocks, for if they are in large numbers there will be scores mutilated by being trampled on. The birds seem to lose their heads and literally run themselves to death. We have seen it tried, and would not advise any reader to try the experiment, at least not with valuable market birds. Another point worth remembering is never to feed the birds to excess. As soon as they begin to dawdle with the food remove it, and they will be ready for the next meal when it comes.—"Utility Poultry Farming."

* * *

Geese in Poland are driven long distances to market, and to protect their feet they are shod in a curious and ingenious fashion.

They are made to walk about in melted tar and afterwards through fine sand. In this way their feet get ready-made shoes, which will stand the roughness of the roads.

Burford's "Magic" Egg Preserver.

The Safest, Cheapest, and Most Convenient Form of Preserver.

THOUSANDS OF POUNDS WORTH OF EGGS

Preserved with

BURFORD'S "Magic" Egg Preserver.

Sloggers and Non-Sloggers.

In on of those delightful paragraphs in which "Hardshell" of the Journal entertains and of course educates his readers we came across the following sentence:—"The Hawkesbury averages continue to show that the limitation of entries to those people who wholly or partly slog their daily crust (good phrase that, expressive and characteristic) out of poultry is not conducive to the making of the best averages whatever the other results may be. Our impression is that the best way to interest people in poultry is to show them good figures and as those at Hawkesbury are not too good, it is hard to understand what results are expected to follow the limitation of entries." The implication, of course, being that the cream of the good figures elsewhere comes from breeders who do not have to slog, etc.

To us the value of the Hawkesbury rules appears to be considerable for do they not tend to test the bigger problems of the finance of poultry keeping and do not the figures show what the professional as against the amateur and specialist is doing. Further in doing this do they not furnish the best possible guide to those who may be intending to take up land and do some "slogging." If, at this late date, we eliminate the education of the man on the land or in fact do not make it a very leading factor in competition work we simply reduce them to a tu'penny ha'penny back yard proposition. At Hawkesbury they are getting right down to the bones of the question. The competitors there are presumably a little better than the average of the class of sloggers and it is of more importance for a man who is about to "slog" to know what present and past "sloggers" have done than to have the doings of those who do not "slog" presented for his information.

We do not expect friend "Hardshell" to see the matter from our point of view for in many pleasant discussions we have never been able to persuade him that in the consideration of the probabilities of any situation he is apt to be guided in his view by the best recorded results from the unusual man or hen rather than average results from average people or poultry. It is, of course, good to aim high, good perhaps "to hitch your waggon to a star," but in bed rock commercial poultry work it may not improbably lead to disastrous results.

It is becoming increasingly evident that profit in poultry depends more on the man than on the hen. Take any competition, it is probable that the majority of the birds are more or less tinctured with Padman blood, whilst some no doubt are practically pure stock from that or other leading strains. If the gift of knowledge followed the sale of stock or eggs then Australia would be flooded with record laying birds but it does not.

Padman stock (we use the name in no sense personally) in other hands may or may not give Padman results. It is not the fault of the stock, it is not altogether the fault of the man behind them, it is simply that he has not what for want of a better word we may call "gift." Now as 1,000 competitors have up to date only brought to light one supremely gifted breeder, with perhaps a score who have intuition and luck in a rather less degree, it is best to judge the possibilities of poultry work by the doings of the remaining 979 of whom the Hawkesbury sloggers may be said to be a rather better than average sample. In a word the good work at Hawkesbury may be summed up by slightly altering Hardshell's words and saying "The best way to educate people in poultry is to show them real figures."

Correspondence.

A PRACTICAL UTILITY FOWL.

Sir.—Allow me to say a word for the "Golden Wyandotte Brown Leghorn cross." My experience teaches me that this cross is a success, our egg basket has been kept well supplied while farmers with over one hundred hens have been getting very few eggs, these birds are hardy, docile, plump, small eaters, good layers, pleasing to the eye, and admirably suitable for those who require a few good all round fowls.—I am, yours etc.,

R. HIGGINS.

Meat Meal.

THE SUPHERPHOSPHATE OF HENDOM.

Everybody knows that South Australian soil is deficient in phosphates and that generally speaking the farmer owes from one to two-thirds of his crop to superphosphates. It is not so generally known, though it ought to be, that wheat and its products, all vegetable growth, and that mysterious compound known as "scraps" in poultry literature, are all markedly wanting in protein which is an important item in the composition of an egg. Obviously then it is good policy to fertilise the hen as the farmer fertilises his soil with the missing ingredient. In poultry work, meat rich in protein takes the place of phosphates on the farm. If the farmer had to make his own super, grind his own rock and treat it, or buy his own bones, add his acids and generally make a mess of things he would probably come to the conclusion that the game was not worth the candle and would gaily retire into the bankruptcy court. Fortunately the manufacturer came to his assistance. Just so with the poultryman, when he had to purchase his bones and grind them, or buy, boil and mince plucks and various other unpleasant products of the slaughter yard, he did not think the game worth the candle and howled for the Government to raise the price of eggs so as to enable him to dodge the official receiver. In his case, too, the manufacturer has been kind and placed at his disposal a clean, dry, non-odorous product in the shape of meat meal, which is, in truth, the missing link in many poultry balance sheets. Just at present when the Government have unavoidably withdrawn their official nose from the meat meal business owing to lack of supplies,

"COMET" INCUBATORS

G. T. Miller, Kingscote, K.I.:—"The Incubator that I had from you has given entire satisfaction, it hatched 95 per cent. of the fertile eggs.

Glazed Drying Box.
Cold-rolled Pure Copper Tank.
Patent Silver Atmospheric Burner.
Brass Capsule Regulator.
Sensitive Accurate Thermometer.
Evaporating Tray.

Use a "COMET" Incubator and be sure of a Successful Hatch.

NORMAN & CO., Sole Importers. BANK STREET, ADELAIDE.

providence in the shape of the Queensland Molasses Co., aided and abetted by Mr. C. W. Muecke (see advertisement this issue) has made it possible for poultrymen to still evade the attentions of the gentleman referred to, by placing on the market the "Botany Egg Producer." This preparation is inoffensive to the most sensitive nose, might in fact be stored in the drawing room, but what is of more importance is, that its composition shows that it is right up to the mark in "essence of meat," the veritable missing link in a great deal of the poultry work of the State. Finally it is put up in packets of various sizes, is, or will be stocked by all up-to-date storekeepers, is cheap, and there are at a moderate computation, three-quarters of a million S.A. hens waiting to eggily express their gratitude for some of it. Ask for it to-day or you will miss the winter-egg bus and keep on asking.

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Line-Breeding.

(From American Poultry Journal).

The irresponsible use of the term "strain" for a flock of hens that may be owned by anyone has almost cast the shadow of shame on the faces of those who fully understand and value the name for its true meaning as well as the real value it carries when honestly present. When one can sustain a breed of fowls upon his yards and produce hundreds of them each year, and never add to his flock a male bird for new blood for over eight years, he may claim to understand line breeding, providing advancement has been made each year in all directions where improvement was desired.

Line breeding is to produce, in direct line, year after year, from one common source or progenitor. A strain is the result obtained from continued line breeding that has established both the breed characteristics as well as a family resemblance in the descendants. It is quite possible to line breed and not establish a "true strain"—a well established fact, the working of which may be seen upon a farm where a large flock of fowls may be found, all of which have descended from one common progenitor, or, again, in the yards of some breeder who has continued unsuccessfully for years to breed from the product of one original trio. Because we may have bred in line after this unguided fashion will not give us title to the right of claim to a strain.

"BOTANY" Egg Producer (Meat Meal).

Means More Eggs.

Arrangements have been made for regular Shipments from SYDNEY.

Composition: — Meat Meal 25 per cent., Blood Meal 25 per cent., Blood Meal 25 per cent., Bone Grit 20 per cent., Spices 5 per cent.

— This Will Make Fowls Lay.

Packed in 7, 14, 28, 56, 112lb.
Price 1/6, 2/6, 4/3, 7/6, 13/6

Obtainable from all Storekeepers and Seedsmen.

Line breeding to be of value must start from a very solid foundation if size and vigor are to be maintained, for in the loss of either failure is assured. More ailments come to our flocks from lack of constitutional vigor than from all other causes. A male of declining vitality, caused by lack of constitutional vigor, is more to be dreaded than ailments of any kind that show their ravages as they go. Such a male sows the seed of future destruction; the dreaded disease kills as it goes; the one robs us of our present hope, the other undermines our future. For these reasons select for the upbuilding of a strain specimens of extraordinary vigor as well as quality.

We should prefer for our start the very finest specimen of a male possible to obtain, but we should not allow quality to blind us to other faults. Size and vigor should have equal consideration, because on these we must depend in future years to sustain us in our effort to establish quality upon a lasting foundation that will not crumble beneath our efforts and end our labour of years in failure. With equal care we should select three hens and three pullets, if possible the pullets of the same blood as the hens. The hens alone we should bred to the male, holding the pullets in reserve for another year. To fully succeed in the producing of a strain by line breeding, and to sustain it, we must begin right and follow a set rule within the lines of nature.

— Proper Plans. —

In planning for the future do not overlook the present. It might be well for you to placard your houses with the following plan:

Be absolutely certain as to the male.

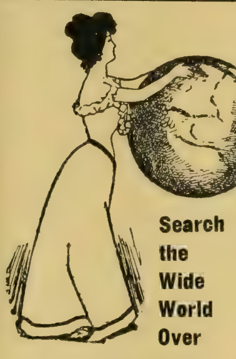
Start with the best hens to be obtained.

Hold in reserve three pullets of equal quality.

Plan to intermingle this blood for benefit.

The selection of a male to father all future progeny of the contemplated strain is a task of vital importance. Many think a number of males necessary for the work in hand, but this is a mistake; one of the right quality is better than a number.—(To be continued.)

Mr. A. H. Padman forwards us a copy of his season's catalogue. Though the public performances of his birds would appear to justify what is commonly called "a skite" of the very loudest description, Mr. Padman very wisely lets the figures which record the doings of his birds do all the talking. Even the obvious label "Something to crow about" which one might expect to find attached to the photo of the crowing rooster which decorates the front page, is omitted in this severely plain record of hard facts, cold figures and excellent illustration which bears convincing testimony to the unapproached position held by this strain in the poultry world to-day.



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45,000 of these celebrated pianos have already been purchased by the general public.

Allan's Limited
53 RUNDLE ST., ADELAIDE.

Turkey Rearing.

Some people maintain that turkeys are the most delicate and difficult to rear of any variety of domestic poultry; others, on the other hand, rear them most successfully. This difference depends entirely upon the manner in which they are raised. Turkeys are birds that are more susceptible of injury from being on foul ground than any other variety of domestic poultry, although all suffer from the practice. To put young turkeys under a hen in a coop in an ordinary farmyard is to court failure. They cannot withstand the emanations from the ground, and the unwholesome surroundings, even if they obtain the natural green food which is so essential to their health. It should be borne in mind by all who are rearing them that the greater liberty that can be given to them, so as to enable them to obtain their own natural green food, the more successfully can they be reared. The idea that turkeys are exceedingly delicate, and must be kept closely confined under hens in coops in the poultry yard, is a fallacy. They are only delicate when the attempt is made to rear them on stale ground, and they are prevented from obtaining their own natural vegetable food, which should constitute the greater part of their dietary. They can be reared in a practically wild state with very satisfactory results. Of course, the presence of foxes is against them, but where these animals are not numerous the wider the scope given to the turkeys the better. If properly bred, they do not suffer from wet, as is commonly supposed.

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Fattening Young Fowls.

The quickest way to fatten fowls for the table is to put them into special coops and feed them with meal. Premising that they be young—say 16 to 18, or even 20 weeks old—and fleshy, two weeks' confinement ought to make them very good. The birds must have room in the coop to stand up and shift their positions, but not to move about. They should be fed three times regularly each day, and their food should be soft meal, as it is almost impossible to get fowls in proper form on hard corn. Pollard, barley meal, Indian meal, or rolled and ground oats, mixed with a little rice flour and skim milk, and occasionally dripping or suet, is good food. The feeding troughs, which must be kept constantly scoured, should be placed before the birds at regular intervals, the first being directly at daybteak; and when they have eaten sufficient it is best to remove the troughs, placing a little gravel within reach of the fowls to assist digestion. The food should be freshly mixed each day, and no more given than will be eaten clean at each meal. Keeping the fowls without food for some hours after they are put up frequently induces them to take it more readily afterwards; but sufficient attention is rarely bestowed on the various details of preparing and supplying food, hence complaints of the fowls deteriorating in the fattening pen are far from uncommon. A coop 3 ft. high, 2 ft. wide, and 4 ft. long will admit from six to eight fowls; the bottom and front should be of bars 3 in. apart; a board outside in front, 3 in. wide, will serve as a stand for the food trough. The coop should be kept dark between the times of feeding, by hanging old sacks over the front, during the day. Sleep and warmth promote fattening; but stale food, irregular times, coops in draughts and places not protected from cold, and the sight of fowls at liberty do not. The coops should be about 3½ ft. from the floor, and underneath strew ashes or dry earth, mixed with powdered lime, so the droppings of the fowls may be easily removed.—"Exchange."

◆

Handling Pullets.

Get the birds tame. The tame hen is the contented hen, and the contended hen is a laying hen. Give them any amount of exercise; pile up a heap of grass or straw and hide the grain so that they would have to scratch it out. The medium-sized, quick, and active birds are best. They should also be long in the back, deep and wide in the stern, be good feeders, and stand with their legs wide apart. Feed on mash, oats, wheat, and as much green feed as they will eat, lucerne for choice, as it puts up strong bones. Feed meat twice a week, and not much at a time. Have a tin in the yard in a dry place with sharp stone grit, shell grit, and charcoal for the birds to get at. Once a week mix up some ground charcoal in the mash. Charcoal strengthens the digestion and keeps the bowels free. Provide decent nests for the birds to lay in. Make a hollow in the ground in one corner of the shed, put some bricks round it, and add a little straw and put a box over it. Do not coddle the birds in any way. —"Hardshell."

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The Growing Pullet.

Pullets that have been improperly grown can never become good layers no matter how well they are handled afterwards. By good feeding the body may be brought to normal size, but the internal organs have ripened without making the growth they should, and no amount of food will bring them into more than normal activity. The time to prepare for eggs is from when the chicks are hatched, and from then on they should have such care as will bring the pullets to laying at the proper time, fully developed, with strong vigorous constitutions. The diet of the growing pullet should be very simple, and may consist entirely of hard grain and a little meat, though most breeders prefer the ordinary morning mash and evening grain ration of wheat and cracked maize.—Exchange.

◆

Publications Received.

The Commonwealth Year Book recently to hand contains a wealth of statistical information. It is a work of very great value to any student of Australian progress and development in all branches of industry and enterprise.

STEVENS' POULTRY MIXTURE

CURES COLIC, CHOLERA, AND DIARRHOEA IN ALL FORMS.

PRICE 1/6 and 2/- PER BOTTLE.

J. P. STEVENS, Chemist,

69 and 71, RUNDLE STREET, ADELAIDE.

TICK

South Australian poultry owners have found that the very best remedy for the TICK CURSE is

Faulding's Phenytas.

Periodically dip the infested birds and spray infested houses and runs with Faulding's Phenytas and there will be no further fear of tick.

FAULDING'S PHENYTAS is Absolute DEATH TO THE TICK

Pigeons and Canaries.

O.K. Lofts.

By "Rambler."

A party of friends, including Mr. J. Martin, of Flinders Street, Adelaide, recently paid a visit to the O.K. Lofts where they were welcomed by the proprietor, Mr. E. A. Grosser. After paying the owner a well deserved compliment on the general appearance and arrangement of the houses and well grassed flights which showed how well the health, vigour and hardiness of the stock is looked after, a more careful inspection of the inmates was made. In loft No. 1 there were 40 odd hens mostly African Owls, Blondinettes, Turbits, and Short-faced Tumblers, amongst which were noticed the Black Laced Blondinette, winner of the 2nd ticket at the late Sydney Show, and another of the same variety, a real gem, winner at the same show in 1909. In loft No. 2, which is a small one, used for pairing birds at the beginning of the breeding season, we found three cocks, all winners. The first to be handled was the beautiful imported Black Laced Blondinette Cock, winner 1st and Champion at Sydney against 21 competitors. He is a wonder for lacing and has a good bold head and front. Next came another imported bird, a handsome little short faced almond Tumbler, also a Champion winner at Sydney against 16 others. The third bird was a nice White African Owl (Patzy) bred 1910, winner 1st Sydney in good company. Mr. Martin, who is an owl fancier himself, classed him as a real beauty, good head, round and well set beak with nice small body. After leaving this loft the next bird noticed was a full brother to Patzy of just the same quality and yet another of very much the same breeding. Mr. Grosser had, however, kept the pick of the bunch till last, this is White King, another full brother to Patzy. He is extra good in head properties, being as round as a marble, very close in feather and small in body. In loft No. 4 we found a lot of old cocks in Blondinettes, Nuns, Owls, and Tumblers, amongst them a beautiful Blue Laced Blondinette with a record list of prizes behind him, including three times Champion at Sydney Royal, best bird in the Show at Lithgow, N.S.W., in a very large entry; also winning at Maitland, Orange and Fanciers' Association, first every time. Mr. Grosser also pointed out some very good Black Laced, one of which had been placed second at the Sydney Show for the last three years. After this a nice lot of Tumblers, Nuns, and Magpies were shown. In loft No. 5 there were a number of feeders and odd birds for sale, a lot of nice quality stock, which will no doubt give satisfaction to whoever may become their future owners.

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Separation.

Opinions vary very much upon the question of separation of pigeons after the nesting season, some holding that it does injury, others that if it does no injury it does not do any particular good, and in any case is not worth the extra time and trouble entailed. If you have proper convenience, my advice is, by all means separate, as soon as ever you have bred what youngsters you require; by this means your birds will undoubtedly get a better moult, and although they may be a little more trouble to follow, you will be well repaid. To those who have plenty of accommodation, or who have not their lofts over-crowded, separation is not a very difficult thing, but unless you are in a position to separate thoroughly, out of sight and also out of hearing of each other, you will find the birds in a constant state of worry and excitement from morn until dark. This, of course, cannot give them an opportunity to rest and get on with the moult as they should do, and at all events counteracts to a large extent the very fundamental principle of separation. Lofts of birds separated by nothing but a light lathe partition may seem to do all right, yet in all probability if the owners had spent a short time daily with their birds during the warmer part of the day they would have heard such a calling and tail sweeping, and seen the hens responding, as would surprise them. When the birds can be properly separated, in a different loft—at all events, out of sight of each other it is better to separate. You get a better and an evener moult, and your birds, by virtue of being quieter, recuperate their energies. When separated, you must take great care in turning out your birds for exercise, or you will find your hens wandering off in search of a mate. When you first separate let the cocks out during the morning and the hens during the afternoon; then, as the daylight shortens later on, only turn them out on alternate days, and when any doubt exists as to the fitness of the weather keep them in altogether. If you have not proper convenience for effectually separating, and, as a consequence, cannot do any other way then that of keeping the sexes together, you will have to prevent, as much as possible, their breeding late.—"Feathered World."

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That You can Have Your
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B. WALLIS,
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Coachbuilders' and Bicycle Builders' Nickel-Plating a Speciality.
SATISFACTION GUARANTEED.

S.A. Canary and Pigeon Society.

"Quite the best to date," was the unanimous opinion of the many fanciers who visited the show. The arrangements were, as usual, excellent, the very best use being made of the somewhat limited space. The number of pigeons shown was 371, and there was a noticeable advance in all round quality.

Pouters (judged by Mr. W. B. Viney) —Blue Cocks (3), a middling lot—E. Hefron 1st, an easy win; W. J. Hughes 2nd. Blue Hens (2) — E. Hefron 1st, and Special for Best Pouter, with a good one. Black, Red or Blue Cocks (3)—Three good ones, with W. F. Hall well in front of E. Hefron (2nd). E. Hefron, 1st in hens with a bird running his blue champion very close; no other competitor. A.O.C. Cocks (2)—E. Hefron 1st; W. J. Hughes 2nd; just fair birds. A.O.C. Hen — W. F. Hall 1st, only entry, a good one. Cock or Hen under 12 months (2)—W. F. Hall 1st; same exhibitor entered anotner bird, both promising. Pigmy Cock (1), Pigmy Hen (1) — F. Crotty 1st in both; useful birds.

Carriers (judged by Mr. W. B. Viney) —Cock or Hen (6)—A. E. Miller 1st and 2nd; pretty poor. Judge remarked that he could not find another Carrier in the class, so no third awarded.

Dragons (judged by Mr. T. Koerner) 24 entries in 8 classes—Blue Cock (3) —C. W. Creer 1st and Champion for Best Dragon; W. B. Viney 2nd; J. Langley 3rd. Blue Hen (2)—C. W. Creer 1st and 2nd. Grizzle Cock (2)—C. W. Creer 1st. Grizzle Hen—(1) W. B. Viney 1st. A.O.C. Cocks (6)—J. Laing & Sons 1st; W. B. Viney 2nd; C. W. Creer 3rd. A.O.C. Hens (8)—C. W. Creer 1st; H. S. Gillies 2nd; J. Langley 3rd. Cock or Hen, under 12 months (3)—C. W. Creer 1st and 2nd; May Bros. 3rd.

Antwerps (judged by Mr. T. Koerner)—Short-face Cock, any colour (3) W. B. Viney 1st. Short face hen (1) —H. E. Chase 1st.

Show Homers (judged by Mr. W. B. Viney). 15 entries in 7 classes—Blue or Black Chequer Cock (3)—H. S. Gillies, of Hamley Bridge, who has not been long at the game, scored 1st and Special with a beautiful blue chequer; F. Goodwin 2nd. In hens (4)—all good ones, same placing. Blue Cock (1)—F. Goodwin, a bit small and beginning to show age but a typical bird for all that. Blue Hen (1)—F. Goodwin. Judge remarked "Don't like her but well worth the ticket." A.O.C. Cocks (2)—H. S. Gillies 1st. A.O.C. Hens (1)—same exhibitor, a good one; should prove a good stock bird. Cock or Hen, under 12 months (3)—F. Goodwin 1st and 2nd, good useful birds.

Working Homers (judged by Mr. W. B. Viney).—Blue or Black chequered cock (2)—L. & H. Brougham 1st; also 1st of two entries in hens. A.O.C. Cock or Hen (5)—L. & H. Brougham 1st; A. Hindmarsh 2nd; H. E. Chase 3rd. A nice even lot right through.

Short-face Tumbler (judged by Mr. von Einem. Total of 18 entries; probably the best lot ever brought together in Adelaide. Almond cock (4)—C. Wilkinson 1st and Special with a grand Tumbler, which we take to be one of this fancier's imported birds very stylish and great colour; E. A. Grosser 2nd; H. S. Gillies 3rd. Almond Hen (1)—E. A. Grosser 1st. Whole colour Cock (1)—E. A. Grosser 1st. Whole colour Hen (1)—E. A. Grosser 1st. A.O.C. Cock (1) — C. Wilkinson 1st. A.O.C. Hen (3) — C. Wilkinson 1st; D. Hayward 2nd. Cock or Hen, under 12 months (7)—A lot of good quality in this class—E. A. Grosser 1st, Cup, 2nd, and 3rd; D. Hayward V.H.C.

Long-face Tumblers; Bald Heads and Beards (judged by Mr. von Einem). —Small classes, all prizes going to interstate breeders. W. H. Walker, Sydney, both firsts in any colour feather-legged class. W. J. Hughes, of Broken Hill, 4 firsts in Bald Heads and Beards.

Jacobins. Twenty-six entries in seven classes. Best for a long time. (judged by Mr. T. Koerner). Black Cocks (5)—1st and Special to G. S. Ball with a grand heavily feathered bird; J. Loutit 2nd; R. A. Stobie 3rd. Black Hen (4)—R. A. Stobie 1st; F. Crotty 2nd; J. Loutit 3rd. Red or Yellow Cock (3)—F. Crotty 1st; G. S. Ball 2nd; R. A. Stobie 3rd. Red or Yellow Hen (2) — F. Crotty 1st; G. S. Ball 2nd. A.O.C. Cock (4)—A.O.C. Hen (3)—F. Crotty 1st, and R. A. Stobie 2nd in both classes. Cock or Hen, under 12 months—F. Jarvis 1st and 3rd; R. A. Stobie 2nd.

Magpies. Sixteen entries in four classes (judged by Mr. R. A. Stobie). Black Cocks (4)—T. Koerner 1st, special, and 2nd. Black Hen (4)—Woodward & Mead 1st in a hot lot; T. Koerner 2nd; C. von Einem 3rd. One entry in Red or Yellow Hens; Woodward & Mead a good one. Young class. Cock or Hen, under 12 months (6)—Cup, 1st, and 2nd to T. Koerner; C. von Einem 3rd; winner a very classy black.

Fantails. Fifty-three entries in eleven classes. Said to be a record for the Commonwealth. Well handled by Mr. C. C. Dittmar. White Cocks (10) — 1st, Cup, 2nd, and 3rd to Baulderstone and Creer, a grand team, with other good ones to follow. White Hens (12)—1st, Special, and 2nd to J. W. Loutit, well placed; with E. S. Lewis 3rd. Black Cocks (4)—L. & H. Brougham 1st; D. Hayward 2nd. Black Hen (4)—W. H. Walker 1st; J. Loutit 2nd; L. & H. Brougham 3rd. Blue Cocks (4) — Baulderstone and Creer 1st; H. G. Gray 2nd; W. & H. Gard 3rd. Blue Hens (3)—H. G. Gray 1st; W. & H. Gard 2nd and 3rd. A.O.C. Cock (3)—H. G. Gray 1st; W. & H. Gard 2nd; R. Loader 3rd. A.O.C. Hen (3)—H. Gray 1st; W. & H. Gard 2nd and 3rd. Cock or Hen, under 12 months—D. Hayward 1st and 2nd; winner a nailing good bird, must have given Baulderstone and Creer a stiff go for the Cup. J. Loutit close up 3rd. On the whole an extra good class. Any colour laced Cock or Hen—E. S. Lewis 1st; G. S. Ball 2nd; R. Loader 3rd.

Turbits (judged by Mr. R. A. Stobie). Twenty-seven entries in nine classes, several imported birds being penned. Black Cocks (6)—C. von Einem 1st; T. Koerner 2nd and 3rd. Black Hens (4)—The position was reversed—T. Koerner 1st and 2nd, with von Einem 3rd. Blue Cock—E. W. van Senden 1st in class of two. Blue Hens (2)—C. von Einem 1st and Special with a rattling good pigeon. Same breeder penned the only silver, a good cock. In Red or Yellow Cock or hen (4)—the placing was van Senden, Giles, von Einem. In A.O.C. Cock (1) and A.O.C. Hen (1) E. A. Grosser penned a couple of good ones. In the young bird class the Cup was won by Mr. T. Koerner, who also penned the third bird; E. A. Grosser taking the second ticket.

Orientals (27) (judged by Mr. T. Koerner)—3 Turbiteens, penned by D. Cruckshanks, faced the music; good quality. Blondinettes (24). Messrs. E. A. Grosser and C. von Einem provided the bulk of the entries. Black laced cock (5)—E. A. Grosser scored 1st, Cup, 2nd, and 3rd, with birds of tip top quality. In hens (3) — Same breeder 1st and 2nd, with W. J. Hughes 3rd. In A.O.C laced Blondinette (6)—E. A. Grosser 1st and 2nd; von Einem 3rd, provided the winners. The Hamilton fancier scooped in Any Coloured Blondinette (4), his three entries being awarded 1st, 2nd, and 3rd. In the young class (6) von Einem got home with a beauty; Grosser filling the places. A.O.V. Cock (only one entry)—G. S. Ball a good one.

Owls, English (9)—Mr. T. Koerner judging, placed G. S. Ball 1st and van Senden 2nd and 3rd in both cocks and hens. Only one entry in

ENGLISH OWLS.

Owing to want of necessary time, Mr. van Senden wishes to dispose of his Exhibition and Breeding Stud of English Owls comprising; NINE PAIRS OF BLUES AND SILVERS, retaining only a few of last season's birds. This stud includes some of the best and most typical birds in the Commonwealth, and has produced probably more winners than any other including Mr. Ball's FIRST AND CHAMPION COCK AND FIRST HEN at late Canary and Pigeon Society's Show and recent WINNERS IN MELBOURNE AND SYDNEY.

This offers an opportunity of acquiring an old established and reliable pedigreed strain at a very moderate outlay.

The bird can be seen by appointment. E. W. van Senden, Ravenscroft, Walkerville.

E. W. VAN SENDEN,
"Ravenscroft," Walkerville, S.A.

young class — G. S. Ball. African — Judged by Mr. E. W. van Senden, who found some excellent material penned for his decision. Mr. van Senden has kindly supplied the following note of the class. Black Cocks (3), a good class; 1st, G. S. Ball, a bird with good skull and beak; E. A. Grosser 2nd; J. Martin 3rd. White Cocks (3)- E. A. Grosser 1st with a very grand headed bird, only fault a trifle big; A. E. Miller 2nd and 3rd. White Hens (3)-E. A. Grosser 1st, a very typical pigeon; A. E. Miller 2nd; pen 339 (Ball) empty. Red or Yellow Cock (1)—E. A. Grosser; a good red but on large side. A.O.C. Cock (3) 1st, E. A. Grosser, a good Dun; 2nd, same owner a Dun pied; 3rd, J. Martin. A.O.C. Hens (4) 1st, E. A. Grosser, Black Tailed White hen, an excellent bird; J. Martin 2nd and 3rd. Cock, under 12 months—1st, Cup, 2nd, and 3rd, Grosser; three very promising birds; winner should develope into a Champion. Ball, pen 349, V.H.C., a Black, loses on top skull · pen 351 (Koerner) is another good Black. Hen under 12 months (5)—1st Ball, a very neat black pied; 2nd, Grosser, good quality white but rather larger; 3rd, von Einem, good pied Dun.

Saddle Backs (11); in six classes.—Little competition, J. A. Sullivan penning ten of them and winning all prizes. A fine exhibit. Special went to a very excellent Black Feather footed striped cock. Mr. Viney judged these classes.

Nuns (5)—Only two classes (judged by Mr. Koerner).—E. A. Grosser 1st in both; Ball 2nd; Stobie 3rd in cocks.

Archangels (1)—Only one bird penned by H. S. Gillies.

Helments (S) — A nice lot. Black cock (3)—Martin 1st and 3rd; Stobie 2nd. Black Hen and Red or Yellow Cock; one in each class penned by J. Martin. Red or Yellow Hen (3)—R. A. Stobie 1st; J. Martin 2nd.

In A.O.V. cocks (5)—Woodward and Mead (Vic.) won with a fine Scanderoon, a novelty which attracted a lot of attention. The breed is certain-y a distinctive one and likely to catch on; W. J. Hughes 2nd; Ball 3rd. Hens (3)—G. S. Ball, 1st; F. Marks 2nd.

In Novice Class, H. S. Gillies penned the best bird of the nine entered, followed by B. Baulderstone 2nd, with D. & G. Cruickshanks 3rd.

Boys' Classes: — The Society does well to encourage the youngsters. Four classes were provided, which brought out an entry of 20 with some really good pigeons amongst them. A. V. Long Face Cock (6) found B. Baulderstone 1st; D. & G. Cruickshanks 2nd; May Bros. 3rd. In hens (5) — the Cruickshank partnership scored 1st, beating C. Ault (2nd), with A. Martin 3rd. In A. V. Short-face Cock, R. E. Grosser beat the Keswick firm for first place, and in hens the reading was R. E. Grosser 1st; B. Gillies 2nd; D. & G. Cruickshanks 3rd.

Just a hint to the Society to end with, it is, that the early payment of prize money is a fitting finish to a uccessful show.

Broken Hill Show.

Mr. E. A. Grosser, judge of pigeons, writes that in pouters Broken Hill had as good a collection as had ever been shown in Adelaide, and in whites they could surprise some of the Adelaide fanciers. In fantails there were some beautiful birds, but a number were moulting and failed to secure the points. In magpies the exhibits were very good, but very wild, which made judging difficult. These birds were badly shown. In turbits, blondinettes, and owls, some of the birds could hold their own at any of the South Australian shows. The working homers were a nice lot right through. The first three winners in show homers would, if sent to Sydney, stand as good a chance as they did here. The tumblers right through were a very strong class. The "any other variety" also brought along a good collection. The cup this year was won by Mr. W. J. Hughes by 20 points.

PRIZE LIST.

— Pigeons. —

Pouters. — Cock (white): W. J. Hughes, 1. Hen: H. L. Hammond, 1; W. J. Hughes, 2. Cock (any other color): W. J. Hughes, 1; W. C. Kernot, 2; W. J. Hughes, H.C. Hen: D. Cruickshank, 1; C. W. Creer, 2.

Dragons.—Cock (white): J. Dally, 1. Hen: A. J. Arthur, 1. Cock (black): A. J. Arthur, 1; P. Hallet, 2. Hen: J. Dally, 1; A. J. Arthur, 2. Cock (any other color): J. Dally, 1; A. W. Creer, 1; A. D. Greaves, H.C. Hen: H. S. Gillies, 1; A. W. Creer, 2 and H.C.

Antwerps. — Cock (any variety or color): A. D. Greaves, 1; W. R. Dowling, 2. Hen: A. House, 1.

Tumblers. — Cock (short faced, any color): J. Dally, 1; C. H. Wellington, 2; J. Dally, H.C. Hen: S. Dally, 1. Cock (feathered leg, black): P. Hallett, 1; R. Henwood, 2. Hen: R. Henwood, 1. Cock (feathered leg, any other color): R. Henwood, 1; P. Murray, 2. Hen: P. Murray, 1; P. Hallet, 2. Cock (clean leg, other than short faced, black): Glen Cockrum, 1; W. C. Kernot, 2; P. Henwood, H.C. Cock (clean leg, other than short faced, red or yellow): C. H. Wellington, 1. Hen: Glen Cockrum, 1. Cock (clean leg, other than short faced, any other color): J. S. Guidi, 1. Hen: P. Hallet, 1; R. Henwood, 2; D. Callaghan, H.C.

Beards.—Cock, (short faced): W. J. Hughes, 1; J. S. Guidi, 2. Hen: J. S. Guidi, 1; W. J. Hughes, 2. Cock (medium faced): J. Dally, 1; R. Henwood, 2; C. H. Wellington, H.C. Hen: J. Dally, 1; R. Henwood, 2. Cock (long faced): P. Hallet, 1; W. J. Hughes, 2, and H.C. Hen: W. J. Hughes, 1; R. Henwood, 2.

Baldheads. — Cock (any color): W. J. Hughes, 1 and 2. Hen: W. J. Hughes, 1 and 2.

Saddlebacks. Cock (feathered leg): H. L. Hammond, 1. Hen, H. L. Hammond, 1; H. S. Gillies, 2. Cock (clean leg).—H. L. Hammond, 1.

Jacobins. — Cock (black): R. J. Bishop, 1. Hen: Tremelling Bros., 1; R. J. Bishop, 2. Cock (red or yellow): Tremelling Bros., 1 and 2. Hen: Tremelling Bros., 1; R. J. Bishop, H.C. Cock (any other color): Tremelling Bros., 1; R. J. Bishop, 2. Hen: R. J. Bishop, 1.

Magpies.—Cock (black): D. Cruickshank, 1. Hen: H. S. Gillies, 1. Cock (red or yellow): P. Henwood, 1; J. S. Guidi, 2. Hen: J. S. Guidi, 1; R. Henwood, 2. Cock (any other color): R. Henwood, 1. Hen: R. J. Bishop, 1.

Fantails. — Cock (white): F. Shaddock, 1; H. S. Gillies, 2. Hen' J. Dally, 1; S. Cockrum, 2. Cock (any other color): F. Shaddock, 1 and 2. Hen: D. Callaghan, 1; F. Shaddock, 2.

Turbits.—Cock (any color): W. J. Hughes, 1; Greaves & Smith 2. Hen: W. J. Hughes, 1; S. Cockrum, 2.

Turbiteens. — Cock (any color): S. Cockrum, 1 P. Hallet, 2. Hen, S. Cockrum, 1.

Owls. — African — Cock (white): R. Henwood, 1 and 2. Hen: R. Henwood, 1; W. J. Hughes, 2. Cock (any other color): Andrewartha and Glasson, 1; W. J. Hughes, 2. Hen: R. Henwood, 1; W. J. Hughes, 2.

Owls.—English—Cock (any color): A. J. Arthur, 1; H. L. Hammond, 2. Hen: Andrewartha and Glasson, 1; H. L. Hammond, 2.

Trumpeters. — Cock (whole color): W. C. Kernot, 1 and 2. Hen: W. C. Kernot, 1 and 2.

Working Homers. — Cock (blue or black chequered): H. S. Gillies, 1; W. J. Hughes, 2. Hen: W. J. Crabb, 1; H. Keech, 2. Cock (red or red chequered): W. J. Crabb, 1; K. Mogg, 2. Hen: Greaves and Smith, 1; F. Shoesmith, 2. Cock (any other color): A. Whitelum, 1; W. J. Hughes, 2. Hen: W. J. Crabb, 1; Andrewartha and Glasson, 2.

Show Homers.—Cock (blue or black chequered): H. S. Gillies, 1; J. Dally, 2. Hen: H. S. Gillies, 1; A. Mills, 2. Cock (any other color): H. S. Gillies, 1; Andrewartha and Glasson, 2. Hen: H. S. Gillies, 1; W. J. Crabb, 2.

Nuns. — Cock (any color): R. J. Bishop, 1. Hen: R. J. Bishop, 1.

(Continued on Page 96).

WOODWARD & MEAD
PIGEON SPYCIALISTS,
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Home Notes.

The Housewife's Daily Walk.

It would be interesting to know the extent to which her walking contributed to the fatigue felt by a busy housewife at the end of a day's toil. There is reason to believe that the result would be astonishing, for quite lately a scientific housekeeper who has learned how to economise labour, and who, moreover, lives in a flat, found (by means of a pedometer) that in the course of her day's work she walked nearly seven miles and a-half.

How much ground a housewide would cover who had two or three flights of stairs to mount and who did not proceed on labour-saving principles can only be guessed, but it might easily be ten or twelve miles. We must not forget, too, that most of this pedestrianism is accomplished amid the depressing conditions of indoor life, without fresh air, the changing scenes, and the pleasant distractions of a long walk on the "open road."

Here, then, is seen the disadvantage of a woman's work as compared with that of her husband or brother. When the men are sitting quietly at their desks, or travelling in omnibus, cab, or train, the angels of the household are trudging to and fro on a journey which, even as a country jaunt, would tire out many a man.

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Are You Stout?

It is generally acknowledged by physical culturists that nothing but hard work will reduce flesh. Mild exercises may serve to keep the body healthy, but to bring down the tissue one must follow the most strenuous exercises, and follow them with the most persistent regularity.

To raise yourself 12 times in succession from a low, stooping position to the full extent is an exercise that will tax your muscular ability, and consequently tire you. And to be really beneficial as a weight-reducer the exercise must tire.

If you are taking a course of home physical culture for the first time with this object in view, it is not advisable at the beginning to carry the exercise to the extent named. Try it six times in the morning and the same number at night, increasing it to 7 or 8, and so on, up to 12. If you are very robust and the exercise is not a severe strain, it may be worked up to 15 or 20.

Standing one one foot, raise the knee six or eight times, at first on a level, and then higher. Gradually increase this exercise also by doing it a greater number of times and bringing the knee further up. These movements are extremely beneficial in reducing the thighs.

To sit sideways on a chair and with the arms behind the head lean as far back as possible, and then raise the body, is another form of physical culture to be followed by the woman who is putting on too much flesh.

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◆

Unnecessary Furniture.

Some wise persons have discovered that everybody is the better for having less encumbrances around in the shape of hangings, bric-a-brac and all the other living-room decorations. Not only do such things tend to distract the mind from more important cares, but they are actually detrimental, because they collect dust particles, and so give home and habitation to hosts of microbes and creatures with long names and worse characters. The more sensible and decidedly better way now is to have very few, if any, articles in the living-rooms of one's home that are not for actual use.

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Household Hints.

Benzine rubbed on the edges of carpets is a sure prevention of moths.

Corks that have been steeped in vaseline are an excellent substitute for glass stoppers.

Shabby leather will look like new if rubbed over with either linseed oil or the well-beaten white of an egg mixed with a little black ink. Polish with soft dusters until dry and glossy.

Suet puddings are most nourishing if the suet is chopped as fine as possible, and the whole thoroughly well boiled. Any suet left over will keep good for weeks if melted down in a saucepan, strained and stored in a covered pot.

The grass stains which are so apt to be found on children's clothing often defy ordinary treatment. A simple method that sometimes answers is to dip the spot in treacle until thoroughly soaked, then wash out the treacle in clear water.

When baking a cake, if your oven is inclined to burn, fold a newspaper and put it on the shelf under the tin. A basin of water in the oven will also help to prevent things from burning, and many people think that the steam from the water helps to make cakes rise.

— Ebony-backed Brushes. —

The bristles of these should be washed in a hot, soapy lather, and rinsed first in hot and then in cold water. The backs should be rubbed with a very little linseed oil and then polished with a soft cloth. Dry the bristles as quickly as possible after washing, or they are likely to get soft and flabby. After washing with soap in this way, dry very thoroughly before using.

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Bread Flowers.

A well-known French artist, has invented a new and curious art. It is that of making artificial flowers from bread-crumbs. Stated baldly, that does not sound attractive, but, according to the London papers, her flowers are exquisitely beautiful. They are modelled from the crumbs of French rolls, and the gluten in the French bread gives them a solid consistency and hardens them. No tools are used except the artist's own fingers, and it is wonderful how all the finest parts of the flowers are shown. Violets, apple blossom, and hawthorn are portrayed, as well as larger blossoms, and in every case, say the critics, they bear the closest examination under the magnifying glass, and even the veins of the leaves are depicted by means of the artist's finger prints. Before the flowers are coloured they look like delicate ivory carvings, but the artist colours them so exquisitely that they are quite lifelike when finished. They are highly valued as works of art, and as much as £15 15/- has been paid for a single spray.

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Mr. A. F. Telfer, so well known in the South East, is now conducting a Produce and General House and Land Agency business at Alfred Chambers, Currie Street, Adelaide (next Bank of Adelaide). Mr. Telfer's long connection with the land should be of service to those desirous of buying or selling farms whilst he is in a position to supply the wants of those who contemplate retiring and living near the city. He is regarded as an excellent judge of produce and his experience enables him to secure the best possible markets.

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Marmalade Making.

As this is the season of the year when oranges are plentiful, many of our readers will be glad of these hints and recipes for making marmalade. By following these few rules, success will be assured :—

(a) The oranges should be well washed in cold water, and thoroughly dried on a clean cloth. This is best done a day or two before making the marmalade.

(b) Do not try to make marmalade with inferior sugar. Only the best sugar should be used.

(c) Equal parts of fruit and sugar must be used. Marmalade made with a smaller proportion of sugar can never be relied upon to keep.

(d) During the whole time that the fruit and sugar are being boiled together, they should be well stirred. This is the only way to avoid catching.

(e) All scum must be removed as quickly as it rises.

(f) The longest times that the fruit and sugar should be boiled together, unless expressly stated in the special recipe, is 20 minutes. The pots must be not only clean, but absolutely dry.

(g) Unless indicated in a special recipe, the pots must not be covered until quite cold.

— Scotch Marmalade. —

This can be made with sweet oranges, or with sweet oranges mixed with a proportion of Seville oranges. Remove the rind from the oranges in two halves, taking as little of the white pith as possible. Place the rinds in a lined preserving pan. Add plenty of cold water, i.e., enough to well cover them, and cook until they are so soft that they can be easily pierced with anything blunt. Now drain upon a clean hair sieve, and cut into thin slices. (Note: Use a very sharp knife.) Meanwhile, take the oranges and with a blunt knife carefully scrape away all the white pith. Then cut up into small squares, and remove every vestige of pip. Add the fruit to the rinds, and also all the juice which has escaped during the cutting-up process. Mix, and weigh carefully. For every pound of fruit add a pound of the best preserving sugar. Place in a china-lined preserving pan. Bring to the boil, and boil for 20 minutes. Test in the usual way—i.e., pour a little on a plate, and if at the end of a minute it is too stiff to flow freely, it is sufficiently done. Pot at once. Leave till cold. Place a round of paper dipped in brandy on top of each, and tie down with well-damped parchment. Store in a very dry, cool place.

— Seville Orange Marmalade. —

Well wash the oranges as directed before. Cut each orange in two the wrong way across. Then slice into the thinnest possible slices with a very sharp knife. Take out all the pips carefully. As you do so, place them in a teacupful of warm water, and reserve. Then weigh the fruit, and for every pound of oranges allow a pint and a quarter of cold water. If they are large and juicy, a pint and a half should be allowed. Place the fruit in a large lined preserving-pan, add the water, cover and leave for two days. Then place the pan on the fire, and cook until the rind of the fruit is so soft that it can be easily pierced with a blunt wooden skewer. Strain the water from the pips on to the fruit. Weigh the whole, and for every pound of pulp allow a pound of preserving sugar. Place the pan on the fire again, bring to the boil. Add the sugar, bring to the boil again, and continue boiling for from 15 to 20 minutes.

— Tangerine Marmalade. —

Well wash and dry the tangerines. Remove the skin in halves; and reserve it. Then with a blunt fruit-knife remove every vestige of the white pith from the fruit. Place the rinds in a scrupulously clean preserving pan. Count the tangerines, and for every eight tangerines allow one Seville orange. Slice these thinly, and add them to the rind of the tangerines. Well cover with cold water. Place the pan on the fire, and cook until the rinds are absolutely soft and can be pierced with a straw. Then drain the rinds upon a clean sieve, and cut tham up into the thinnest possible strips. Next cut up the tangerines, remove every vestige of pip, and add the fruit, together with the juice which has escaped, to the rinds. Mix. Weigh. For every pound of fruit allow a pound of the best preserving sugar. Place the fruit and sugar in the pan. Bring to the boil. Boil for twenty minutes. Test as before directed. Pot in the usual way. Cover, when cold, with a round of paper dipped in brandy, and tie down with well-damped parchment.

— Rhubarb Marmalade. —

Peel the rhubarb carefully. Cut it into 1in. lengths. Allow a pound of sugar for every pound of rhubarb, and a gill of strained lemon-juice for every six pounds of fruit. Place the rhubarb in a pan. Add the lemon juice, and cover (in layers) with the sugar. Let the top layer be of sugar. Leave for 24 hours. Then strain off all the juice, and place it in a preserving pan. Bring to the boil, and boil for 20 minutes. Meanwhile add the very finely-grated rind of four lemons, first well washed and dried, to the fruit. Mix well in, and when the juice has boiled for exactly 20 minutes add the fruit. Bring to the boil again and boil for another 20 minutes. Pot and cover as for tangerine marmalade.

The best kind of preserving pan to buy is one of those enamelled ones which can be bought at any ironmongery shop.

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(Continued from Page 93.)

Blondinettes.—Cock (any color) : W. J. Hughes, 1 ; C. H. Wellington, 2. Hen : S. Cockrum, 1 ; W. J. Hughes, 2. Cock (any other variety) : W. J. Hughes 1 and 2. Hen : H. S. Gillies, 1 ; W. J. Hughes, 2.

— Canaries. —

Norwich Crested. — Clear yellow or buff cock or hen : H. G. Bright, 2 (only entry). Lightly variegated rock: F. A. Hince, ; W. G. Gardener, 2. Heavily variegated or green cock : F. A. Hince, 1 and 2. Hen : F. A. Hince, 1 and 2.

Norwich Crested Bred. — Lightly variegated—Cock : F. A. Hince, 1 and 2. Hen : F. A. Hince, 1 ; W. G. Gardener, 2. Heavily variegated or green —Hen : H. G. Bright, 1 and 2.

Plain Head Norwich.—Clear yellow or buff—Cock ' F. A. Hince, 1 : W. G. Gardener, 2. Hen : F. Shaddock, 2.

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Victorian Pigeon Society.

THE BIG EXHIBITION SHOW.

By "Blue Rock."

In every way this was an unqualified success. The exhibits were never of higher quality, and the arrangements were perfect. A corner of the huge building was reserved for the "doos" which was devoid of draughts and ideal.

In Fantails the display was simply wonderful, no fewer than 21 youngsters competing for the Cup—eventually won by Mr. Wheeler with a sweet one. Other notable winners in this breed were Messrs. Whithall, Lloyd, and Crotty, the latter winning the special for best old bird. In Dragoon classes Mr. R. Courtenay proved almost invincible, practically sweeping the board.

Jacobins were not in good fettle, owing to the fact that the late moult has affected them. Mr. J. J. Young won the Cup, the other notable winners being Messrs. Crotty and Hearne.

Mr. C. E. Ball did well with English Owls, but Africans were weak in quantity, though not in quality.

In Saddlebacks Mr. Shee won the Cup, also doing well in several clases ; Mr. Hendrie secured several prizes in this breed.

Tumblers were strouger than ever, and one noted with pleasure that the Beard class was well filled. Mr. A. W. Hick scoring premier honours.

In other colours Messrs. Buscombe and Belcher carried off most of the prizes, the former winning the Special for Best Shortface.

In Magpies, the chief prizetakers were Messrs. Maude, Ensom, and Mead, the former winning two specials. In this section the judging caused great dissatisfaction and comment, a protest being lodged : the display was a remarkable one, this variety having made wonderful strides of late. Six teams (3 birds any variety) competed in the Teams class, the winner being Mr. G. J. Mead with a trio of Magpies.

In Homers the quality was splendid, and the numbers were there also. The chief prizetakers were Messrs. A. O. King, Nixon, Colvin and Bishop, Mead, Conningsby and Son, Peterson, and Cameron.

O.K. LOFTS.

This is where the Champions are bred. At 1911 Sydney Royal we won 2 Champions, 6 Firsts, 3 Seconds, 2 Thirds with 11 entries only. At S.A. Pigeon and Canary Show we won the "Blondinette" Cup, the "African Owl" Cup, against 15 others also the "Short-face Tumbler" Cup for best young tumbler, all with home bred birds, also a number of Specials, Firsts, Seconds, and Thirds. To give amateurs a start I have for sale Blondinettes, African Owls, Short-face Tumblers, Nuns, Turbits, etc., from 5/ each. Fifty to clear before breeding season. Apply at once to

E. A. GROSSER,
Hamilton, S.A.

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Pigeon Notes.

— By Rambler. —

Mr. F. Charlick has bought two pairs Blondinettes from Mr. Grosser's lofts. These we hope to see amongst exhibitors in the near future.

A Victorian friend writes :—Fanciers over this side look forward to representatives from other States in Victorian pens this year and will be only too glad to hand over cups, etc., to Sydney, Launceston, and Adelaide lofts.

The Port Adelaide Poultry and Dog Society will hold their third annual show on July 27 and 28. As there are two gold medals, one for best short face Tumbler, one for best Fantail, also a trophy value £2 2/- for the best third in the show, besides a 10/6 special in each variety, pigeon men ought to come along and pile up the entries which close with Mr. Coleman, Commercial Road, Port, on the 15th July.

WEAK ANÆMIC WOMEN SHOULD READ THESE WORDS!

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"I suffered from LOSS OF MEMORY AND SLEEP, NERVOUS BREAKDOWN, POOR APPETITE and INDIGESTION. I could not walk across the room I was so weak: in fact, I thought I would never be able to attend my business again.

"To-day I am alive and well thanks to that splendid medicine, which cured me of the ailments specified in this letter, NERVOUS BREAKDOWN IN PARTICULAR. Dozens of Hobart citizens know these words are true, and the chemist who sold me the tonic in Liverpool Street, Hobart.

"I always recommend Clements Tonic to persons in ill-health because I know what it is and what its use means for women, and I hope you will use this letter in the great cause of suffering humanity.

(Signed)
(MRS.) MINNIE NIETOM.
Witness : F. Fowler, J.P., Enmore, N.S.W.

Unhealthy people should remember that good health and Clements Tonic go hand in hand, it may be described as twin brother of health and strength. Send for it to your nearest chemist or store. They all sell it for the public need.

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ADELAIDE.

Editorial Notices.

TO ADVERTISERS.—Alteration of advertisements should be in our hands not later than the 15th of the month.

SUBSCRIPTION.—Posted to any part of Australasia 5/- per year, in advance. Foreign, 6/.

Open Border Notes for August.

Garden Reminders for Amateurs.

Finish rose pruning.

Continue to plant roses.

Top dress lawns and prepare ground for new ones.

Trees and shrubs may be transplanted.

Finish planting deciduous shrubs, climbers, etc.

Seeds of native trees, shrubs, etc., may be sown.

Sow fern spores and make root divisions where desired.

This and next month is the best time for planting evergreen trees, shrubs, etc.

Make small sowings of any of the Half-hardy Annuals in frames or in the open at the end of the month.

Cuttings of carnations, picotees, verbenas, etc., may be put in.

Keep sweet peas well staked and give liquid manure.

Use the hoe between rows of tulips, hyacinths, and other spring flowering bulbs.

Where gum trees are growing tall and straggly, they may be pollarded.

A bed of gladioli put in now will give a good return of bloom.

The size and colour of pansies will be improved by occasional doses of liquid manure.

The surface of any beds of rose or other cuttings should be kept stirred and free from weeds.

For a bright display in early summer put in a packet of Snapdragon seed in a sunny position.

Make divisions of root stocks of any herbaceous perennial plants.

Always prepare position, where a tree, shrub, or climber is to be planted by thorough digging. If the soil is poor or very heavy add well rotted stable manure liberally.

Anyone at all handy with tools can knock up a glass or calico covered frame, for raising seedlings of the summer flowering annuals.

Cut back Zonale Pelargoniums and put in reserve beds of cuttings. Plant out any rooted cuttings where they are to flower.

Cannas may be planted in well enriched beds.

Plant hedges. Prepare a deep wide trench before putting in the plants. Half barrow of old manure to the yard, well and deeply dug in, or a liberal dusting of bone dust will help things along wonderfully. Clip Boxthorn and other hedges as required.

The flowering of cyclamen will be increased and the season prolonged if given weak liquid manure, say half an ounce of guano to each gallon of water.

When sowing or planting always label the pot, box or plant. The ordinary wooden label sold very cheaply by seedsmen, if given a brush over with white paint and written on whilst wet, with a garden pencil, does excellently, and may save a lot of annoyance later on.

In making up new beds do not forget that any manure added will pay for itself many times over. Also remember that there is only one thing worse than no manure and that is too much.

For heavy soils use for preference long coarse stable manure, whilst for light sandy soils cow, or where it can be procured, sheep manure is better.

When using artificial manures, break down all lumps before applying and dust evenly over the surface before digging. It is rather a common mistake to give too much. A mixture at the rate of 4 lbs. super, 1½ lbs. sulphate of ammonia, and 1 lb. of sulphate of potash to each 8 square yards of ordinary garden soils will be ample.

Always remember that to give a newly-planted tree or shrub the best chance, it should be firmly planted and well staked. A little fine mellow surface soil should always be packed over and around the roots, which should be trimmed of all broken or damaged parts. After partially filling the hole, tread or press it down firmly. Earth which is only slightly moist makes a far better bed for the roots than that which is wet.

Caterpillars will be becoming numerous. Hand picking is the best remedy. A good spraying of the plants with Gilchrist's Compound is a valuable preventive.

Plant carnations. Tie up and disbud for extra large blooms as required. Dust the beds with soot and lime and fork in lightly.

Divide any large clumps of Delphiniums. A large and fairly sharp knife is best to use for this purpose.

Take up, divide and replant in rich soil any old stools of bedding Begonias.

Plant out Cinerarias and give liquid manure to those showing bloom. Also stocks, phlox, etc.

How to Keep Cut Flowers Fresh and How to Pick Them.

Cut flowers may be kept alive for a week if the water given to them is changed every day and the stalks are sliced every other day. In the case of Mignonette, as well as of Wallflowers, which quickly impregnate the water unpleasantly, the stalks should be almost stripped of the leaves and a pinch of borax or charcoal added to the water.

In packing cut flowers it is a good plan to wrap the stalks in damp cotton wool, and if the blossoms are fine ones—Roses for instance—to protect each flower from contact with the next by a rouleau of soft, rumpled paper.—Exchange.

A clay soil will store about one-fourth as much moisture as humus and will lose it by evaporation twice as rapidly. Moral :—Conserve and increase the humus and reduce evaporation wherever possible.

Manure for Roses.

The English National Rose Society suggest the following as satisfactory rose manures :—"Basic slag, which contains lime and phosphorus, may with advantage be used in the proportion of 3oz. to 4oz. per square yard, whilst nitrogen may be afforded by a dressing of dried blood or fish guano, followed by applications of nitrate of soda. A good general manure for roses consists of two parts of dissolved Peruvian guano containing 8 per cent. of ammonia, one part bonemeal, half-part sulphate of potash, one part of dried blood, half-part nitrate of soda. The whole should be well mixed, and applied in early spring at the rate of 5oz. per square yard."

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Tidying Up.

Amateurs are often very pushed for time in which to do all they wish to accomplish in their gardens. In the first place save time by having as little "tidying-up" to do as possible. Have a place for everything and keep it there.

If there is no tool shed, use a large box in which to keep all smaller tools, such as hammer, nails, trowel, etc. Keep this handy with the larger tools near the garden door, and no time will be lost in hunting for the tools one requires. After each operation in the garden clear up all necessary things neatly, putting away string, stakes, and burning rubbish at once. Any necessary repairing, painting of chairs, tubs, etc., should be got through during the winter, and when other work is slack. When sowing seeds save the packets, and they come in again when any ripe seed from the plants has been saved for future sowing.

Fragrant Plants and Flowers.

Sweet-scented flowering plants and plants having aromatic foliage are always in request. There are many persons who would sacrifice beauty of form or colour in plants to those with sweet perfume. The finest-shaped rose in our gardens would be passed by for the delicious scent of the common sweet briar. However small and insignificant a flower may be, if it exhales a fragrant perfume it is prized, writes the Australasian.

Nothing has been done, as far as we know, in Victoria, in making a garden or border of sweet-smelling plants, but in England such collections are not uncommon. In our more temperate climate many plants, deliciously scented, may be grown, which in higher latitudes have to be cultivated under glass. A very long list of shrubs and plants could be compiled of those having fragrant flowers or foliage that will succeed in our gardens. Our space will only permit of our giving the names of the more prominent kinds. The rose deserves the pride of place, but fragrant roses are so numerous that individual sorts cannot here be given. In addition to the teas, of various degrees of sweetness, there are musk scented, cinnamon scented, and other subtly perfumed flowers, which are difficult to describe; the old cabbage rose, which is so difficult to procure, has a most deliciously-refreshing fragrance.

Daphne indica rubra is a universal favourite. It is not readily propagated ; it is usually increased by cuttings, also by layers, but both processes are slow. D. indica alba is common in Sydney, but rare about Melbourne. Having white flowers, it makes a nice variety. D. hybrida or dauphine has smaller flowers and foliage, and it is more erect in habit than D. indica. It is very hardy, and a most desirable shrub. There are many other species of daphnes, but they are not procurable at Melbourne nurseries. Daphnes do best in a fairly rich soil, in an open, sunny position, and they stand pruning well.

Boronia megastigma is as popular a plant as the daphne. It is not a long-lived plant ; when it gets to be five or six years old it sometimes dies, often becomes shabby, and not worth keeping. After blooming, it should be well cut in, and so preserve a bushy habit. It is readily propagated by seeds and by cuttings. It will thrive in a variety of soils, but that which is suitable for heaths is usually considered the best ; it will also flourish in pure loam, provided a little sand is incorporated with it. It will not thrive in a moist place, preferring a warm, sunny, well-drained one. There are other fragrant boronias, but megastigma is far and away the sweetest.

The pittosporums furnish some very sweetly-scented flowers. The common P. undulatum is well known. P. tobira, a Japanese species, has creamy-white flowers, freely produced, and strongly perfumed. The plant is of slow growth, but is a very desirable plant for the shrubbery. P. flavum is a tall and fast-growing shrub, with fine, shining foliage, and a profusion of showy, sweetly-scented yellow flowers. Some other pittosporums are also scented.

Most of the jasmines are fragrant. Jasminum grandiflorum is, perhaps, the best of the genus. It may be grown as a bush, or trained up as a climber. Its pure white flowers are particularly sweet. J. officinale is a hardier species, having smaller white flowers, very fragrant.

J. revolutum has yellow flowers, sweet, and showy. The plant is very hardy, and a fine evergreen. J. suavissimum is white, a climber of neat growth, and produces bunches of very fragrant flowers. J. gracillimum is very similar, but is not a very hardy species. J. sambac needs the protection of glass ; it is a splendid plant for the conservatory. All the jasmines do well in good ordinary garden soil.

Amongst the magnolias, we have some deliciously-perfumed shrubs. M. fuscata, the "port-wine" plant, has a fragrance all its own. Its flowers are not showy, and they are no use for cutting, but they retain their exquisite odour for many weeks. M. anonaefolia is something similar to the preceding, but a taller grower. The well-

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known M. grandiflora, with its very handsome lemon scented, pure white flowers, must not be left out of any collection of sweet-scented shrubs. Many of the deciduous magnolias, or "tulip" trees, are nicely scented.

Of the chimonanthuses, C. fragrans, the "winter-sweet" of Japan, flowers at midwinter. The blooms are yellowish, wax-like in appearance, but they emit an odour most exquisite and delightful, and if cut and placed in water will keep fresh a long time, and will perfume a room for a long period. C. grandiflorus is a stronger grower, and has larger leaves, with flowers not quite so highly fragrant as C. fragrans.

The Mexican "orange bush" (Choisya ternata) blooms twice a year, and its glossy foliage, with its pure white scented flowers freely given, make it a most desirable plant. The true Olea fragrans, the Candleberry myrtle (Myrica cerifera), the "poison" plant of the Hottentots (Toxicophlea spectabilis), the Cape virgilia (Vf capensis), Azara microphylla from Chili, with its small yellow blossoms, vanilla-scented, the Madagascar buddlea, elaeagnuses, myrtles, hawthorns, some of the heaths, oleanders, several of the rhododendrons and azaleas, most of the philadelphuses or mock oranges, engenia ugni, many of the bouvardias, gardenia Thunbergi, and gardenia globosa, also the Cape jasmine in warm situations, brugmansias, and lilacs are all desirable sweet-scented shrubs.

If fragrant climbing plants are wanted, the honeysuckles and some of the clematises should not be forgotten. Rhyncospermum jasminoides and the variegated variety, gelsemium sempervirens (the Carolina jasmine), the wistarias, mandevillea suaveolens, some of the passifloras, and a whole host of roses are excellent climbers.

Amongst bulbs having fragrant flowers, there is an immense variety to select from, the most important being the liliums, narcissi, tulips, hyacinths, freesias, amaryllis, tuberose, irises, cyclamens, etc. In herbaceous plants, tubers, and similar things, the poeony, lily of the valley, carnations, pinks, and other members of the dianthus family, wallflowers, stocks, heliotrope, mignonette, sweet alyssum, woodruffe, and lavender should not be forgotten. Then there are many plants with aromatic foliage, such as the diosma ericoides, rosemary, sweet basil, aloysia, balm of Gilead, and many of the pelargoniums. Many scores of annual plants having fragrant flowers could be mentioned did space permit.

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LADY IN ATTENDANCE.

Layering.

— Various Methods. —

Layers differ very little from runners, being so called when art has been employed to make the plant throw out roots when it would not have done so of itself. Some plants have a tendency to throw out roots wherever a joint of the shoot comes into contact with the moist soil, and these only require pegging down to make them form separate plants. There are various modes of layering. The common method is to select a shoot on a growing plant as near the root as possible, and having cut it half through to make a slit in an upward direction, then place a bit of twig between the divided parts and peg down the shoot, burying the joint in the ground. This will stop the progress of the returning sap, which, accumulating at the joint, will cause it to throw out separate roots, and so convert the shoot into a new plant, which may be divided from the parent and transplanted. Sometimes the branch is wounded instead of being cut half through, either by carefully removing a ring or bark below the joint, twisting a wire round the shoot so as to pinch it in, or passing any sharp instrument several times successively through the branch so as effectually to interrupt the returning sap without preventing the uninterrupted passage of the sap that is ascending, and any of these methods will answer the purpose. By taking several of the lower shoots a number of the layers may be made at the same time from one plant without causing it any injury.

— The Chinese Method. —

The Chinese mode of layering is sometimes applied to Camelias, etc. This consists of wounding a branch by peeling off a rind of bark and procuring a flower pot in which some moss is placed at the bottom, filled up with moist earth, and open on one side so as to admit the branch, which should be supported in its place by four little sticks tied to the pot with strings. A piece of wood or brick must be placed inside the pot before the open part to keep the earth from falling out. This operation may be performed with less trouble by using a piece of lead instead of a flower pot. The earth in which the branch is placed should be very moist, and will require frequent remoistening if the season be dry. As soon as the layer is thought to have taken root a deep notch should be made in the branch below the pot. It may afterwards be divided, and the young plant transferred to any part of the open ground. By this method a young tree will produce flowers and fruit at a very small size.

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Mr. R. Correll's Music Warehouse in Flinders Street, Adelaide, is a veritable Mecca to music lovers, for there is to be seen certainly the finest display of stringed and brass instruments in the State. If one instrument is a greater favourite than another with Mr. Correll, it certainly is the violin, and he is well known as the proud proprietor of the famous "Montagnana." The stock of violins is, we need hardly say, both large and varied, prices ranging as low as 10/- to as high as £60, and for complete outfits from 25/- to £70. Mr. Correll is a direct importer of all classes of musical instruments, and is therefore able to supply same on liberal terms. As president of the Band Association of S.A. he has done much to advance the cause of music throughout the State, and his efforts are generally recognised. We may add that Mr. Correll is an expert repairer of violins and makes a specialty of fully equipping both brass and drum and fife bands.

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Evergreen Trees and Shrubs Their Uses and Cultivation.

Evergreens possess peculiar value both for shelter and ornament, and should be more extensively planted, whether used as windbreaks or mingled informally with other trees.

From the ornamental standpoint, they abound in rich dark shades of green, equally valuable as a background for deciduous trees or flowering shrubs and plants.

At all times they furnish a barrier to the wind, and the remarkably picturesque forms assumed by the adult specimens of many species add much to the attractiveness of a country home. In winter, when other trees are destitute of foliage, they lend to the scene an air of animation which mitigates the bareness of the season. If tastefully intermingled with other trees and shrubs they give a warmth of verdure and variety of outline unattainable without their use. That many of the evergreens can be successfully grown upon thin and even poor soils is an additional argument in their favor.

Where grown to show the characteristic beauty of individual trees, evergreens should be grouped naturally and not so closely as to crowd upon each other. Planting in straight lines except as a formal avenue, should be avoided, and, in small groups, the disposition of trees in odd numbers is to be preferred. Immediate effects may be secured by planting thickly, but thinning should not be so long deferred as to work injury to the lower branches of those trees which it is intended to grow to maturity.

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PLANTING.

Evergreens should be planted in the spring, just when the buds are beginning to swell being the best time, or left till the young shoots have begun to harden. They can thus be planted later than deciduous trees. Should the young shoots have appeared defer the planting until they have hardened and the terminal buds have formed. Should the soil, however, be very dry at this time, or in fact, any time after planting they must be watered in order to keep the soil moist. Never transplant evergreens in the late autumn. On the other hand, too early spring planting does not give as good results as that done a little later but rather than do it too late, do it early.

Never allow the roots of an evergreen to become dry. The deciduous trees can recover from a drying out of the roots, but with an evergreen, if the root has lost sufficient moisture to dry the resinous sap, no amount of water will revive it. The sap of evergreens is resinous throughout, and when it becomes dried you have an insoluble material in the cell, checking activity ever after. Nor does it take long for this condition to come about. The small roots, if left exposed to a drying wind for only a few minutes, will be entirely killed. Not only should the roots be protected on this account, but also because the leaves of the evergreen are always transpiring water. The deciduous trees are planted when there are no leaves on the tree, but with the evergreen the leaves are always there, and this doubles the necessity for always having the roots in contact with moisture.

So far as handling and planting the evergreen is concerned, the same or even more care is necessary as with the other class. Sometimes the soil is too dry, in which case it is advisable to give water after the soil has been partly filled in around the tree, and packed. After this water has soaked in, the balance of the soil should be put in, leaving three inches or more of loose soil around the tree. In addition to this, a mulch of strawy manure close around the tree may be used. It will be pretty well out of sight and will assist in holding the moisture.

It is often a good plan to puddle the roots of any tree when set. This is done by dipping them in thin mud, mixed up in a tub or pail. This forms a coating over the roots. Keep the leaves as dry as possible and free from mud. Plant the evergreens as soon as convenient after being dug, but should it not be possible to do so at once, protect the plant by putting it in a cellar or shaded place where as little evaporation as possible will take place.

MISTAKES MADE.

Evergreens in common with other trees are often placed in unprepared and unsuitable soil with little care. The roots in many instances are left exposed before planting, reducing the vitality of the plant so much that even were other conditions suitable the plant could not possibly grow.

If not ready to plant in their permanent places, protect the roots by heeling the trees at once into damp soil or store as directed above. When lifted again, prevent drying out by covering with damp sacking made out of old bags. In the preparation of the soil, dig up about six inches of the surface soil placing it in a pile alongside, making the hole about 3 feet in diameter. Dig out the subsoil to a depth of about 18 inches from the level of the ground. If this subsoil is poor, as it generally is, remove it entirely. If it is in good condition take out half the above amount and place the top soil back into the hole and work up well, mixing the top with the bottom soil, and use the subsoil removed for the surface layer of soil around the tree when planting is completed. This places the soil containing available plant food within easy reach of the tree when it first starts to grow, as that is the time it is most required. After the plant becomes established it can push its way after food. If the subsoil is removed place the top soil into the hole, and to complete the filling use good loam from the vegetable garden or some other place.

With evergreens it is practically impossible to cut back the top without spoiling the natural shape of the tree, and this must be avoided. Never take off the lower lateral branches, as it ruins for ever the beauty of the tree. Some of the small lateral branches can be taken out to advantage and rather improve the whole tree, but by doing too much the beauty of the symmetry and natural shape of the tree is sacrificed, and generally not sufficient foliage is left to support proper sap circulation, with the result that the tree weakens and finally dies. If evergreens are handled properly at planting time very severe cutting back is never necessary.—Journal of Horticulture.

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Plants Under Glass and Shade.

— Pits and Frames. —

Preparations must now begin for the summer display, and sowings can be made in frames under glass shelter of zinnias, portulaccas, gomphrenas, cockscombs, asters, balsams, amaranthus of all sorts, French Marigolds, capsicums, perilla, and statice. As soon as they are above ground plenty of air and light should be admitted, and the glass removed during the daytime in fine weather. These precautions will produce sturdy plants.

Cinerarias should be hardened off by removing the glass or covers from the frames during the fine days, and allowing a little air to enter also at night, excepting when frosts threaten. Two or three weeks of this treatment will harden them sufficiently for bedding out.

In frames where a little bottom heat is available gloxinias, tuberous begonias, or gesneras may be given a start in good free soil. Of course these will require scarcely any water until growth begins.

Cuttings may also be struck in similar frames of coleus, iresines, alternantheras (for bedding), and plectranthus.

Fuchsias can also be rapidly rooted by this method.

Pelargoniums should also be potted on. Show and regal would have been better if kept pinched, to induce bushy habits. These must be kept close to the glass, and those which have had their final shift may receive a little liquid manure occasionally. This class of pelargonium is very subject to green fly (aphis), and require frequent fumigating with tobacco waste or paper prepared for the purpose. Unless this matter be closely attended to they will almost certainly be ruined before the blooming period.

Petunias for staging and calceolarias should be kept potted on, and cyclamen as they show bloom should be removed to the greenhouse.

— The Greenhouses. —

The Chinese primulas, cinerarias, primula obenica, zonale pelargoniums, camellias, immantophyllums or clivias, and cyclamen should make the stages of the cool greenhouse gay during this month. Only a moderate quantity of water should be given, but as the days become warmer the quantity may be increased. Always water in the morning, and tap each pot to detect the usual sharp, ringing sound which a fairly dry soil gives, before watering; or, where the plants are limited in number, it is a good plan to lift each one—weight is generally a sure test of dryness.

When aphides appear fumigate promptly to destroy them, using waste tobacco leaf.

Give plenty of air in fine weather.

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A Fine Foliaged Shrub.

Many of our most useful shrubs are those we prize more for the beauty of their foliage than for that of their flower or fruit. The Euonymus, of which there are several varieties, come under this heading. Although natives of China and Japan, they are quite at home in our gardens. As a rule they are compact, spreading, symmetrical shrubs attaining a height of five to eight feet, and a spread of equal proportions. The flowers are small and like those of many of this same group, unimportant. The fruit which follows is small, borne on short stalks singly or in groups of two or three. The pod is purplish and the aril of the seed is scarlet. However, the fruit does not render the plant showy for not only is it scattered but, before the leaves fall, it is partially concealed. The foliage is neat, evergreen, and in some species variegated. In fact as regards beauty of foliage it ranks very high among ornamental shrubs. As to requirements, it does not appear to be fastidious though of course it needs good treatment for the best results. The neatness of its habit and the goodness of its foliage make it desirable when a specimen shrub is sought, and it is, of course, very useful in any shrubbery.

An interesting member of this family is the Spindle tree, or, giving it its correct name, Euonymus europaeus. It is a tree that most people would pass by without a second glance, for the flowers are very inconspicuous and the foliage of a very ordinary type; however, it compels attention, for every branch is thickly clothed with the curiously-shaped vermilion fruit, with here and there expanded ones showing the bright, orange-coloured coats of the seeds.

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Garden Tiles.

Some gardeners strongly object to tiles for edging. They are certainly not perfect but here are a few points greatly in their favour: (1) About towns they can easily be obtained from local tradesmen, (2) any soil will suit them, and frost does not affect them, (3) they make no harbour for insects, a very good point, (4) they are the easiest edging to lay and when once laid they require no further attention in the way of trimming, a consideration where labour is scarce.

Canterbury Bells and How to Grow Them.

It would be difficult indeed to find a race of plants that will give a better return for a little trouble than the old-fashioned yet beautiful Canterbury bells, as the several forms of Campanula Medium are popularly called. The seeds are cheap and easy to buy, the seedlings can be raised with a minimum amount of trouble, and the resulting plants are so easily accommodated that they form an ideal subject for the beginner to try his or her 'prentice hand on. The plants are true hardy biennials, although by sowing early in the spring under glass plants can be induced to flower the same season.

The early spring is an excellent time to sow the seeds, as the resulting plants then have an opportunity of developing into fine sturdy specimens by the end of autumn. Well prepare a seed-bed in an open position by forking it up thoroughly and breaking any large lumps encountered. Then tread the surface rather firmly and rake over, so as to get a good tilth of fine soil in which to sow the seeds. Draw out flat-bottomed drills 1½ inches deep and 1 foot apart, and scatter the seeds thinly therein. Should the soil be very dry, give the drills a good watering before sowing the seeds. As the latter are small and rather light, a still day should be chosen for the sowing. Cover the seeds with about an inch of fine soil and rake all down neat and tidy. If dry weather prevails after sowing, it may be necessary to give good waterings through the fine rose of a can at frequent intervals until the seedlings have developed their first true leaves.

When the young plants are sufficiently large to be handled with ease, they must be pricked out singly in a bed of well-worked moderately rich soil, placing them in rows 15 inches apart and 6 inches asunder in the rows. If possible choose a showery day for the pricking off, and failing this do the work one evening, giving each plant a good watering in when the work is finished.

Treatment for the remainder of the summer will consist in hoeing frequently between the rows and giving an occasional soaking with water and weak liquid manure. With the end of autumn comes the usual time for transferring the plants to their flowering quarters. This should be done carefully, moving a good ball of soil with each plant so that the roots are disturbed as little as possible. The distance apart to plant where beds are to be filled is, roughly, from 15 inches to 18 inches each way, and when in flower the plants will touch each other and thus form a floral mass. For the front of a border a good system is to insert three plants to form a triangle, each side of which is 18 inches. If it is not possible to plant in the autumn, excellent results can be obtained by leaving the plants in the nursery bed until the following spring, and then place them where they are to flower. In this case a little extra care is needed in moving them. When coming into bloom each plant will need the support of a short, stout stake, and as soon as the flowers are fading they should be removed; by this means a second crop of flowers is frequently obtained.

Fern Propagation.

Ferns are increased in various ways. The most common method is by spores. These occupy a very similar position in ferns to that which seeds do in flowering plants. Many sorts can be readily raised in quantity in this way. On the other hand, some are very difficult, while in a number of instances they cannot be increased by this means, as no spores are produced. If only a few plants are desired, it is quicker to divide up one or two old plants of those which form root-stocks. Several kinds produce bulbils on the fronds. They even develop into young plants. Others have creeping rhizomes, pieces of which may often be cut off with roots attached.

The collecting of spores is very important, where a number of roots are growing together. Being very light, they are liable to be scattered more or less all over the house. Very often plenty of young plants will be obtained from a sowing, but, on attaining to a sufficient size for identification, they may turn out to be some common fern not desired. To guard against this, the fronds should be cut just before the spore cases burst, thoroughly washing them under a running tap, to re-

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SUGAR GUMS and SHADE TREES.
SEEDLING ANNUALS for present planting 2s. per 100, assorted; 2s. 6d., post free.

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move all foreign spores which may be present on the fronds. They can then be placed in bags and dried. Early spring is the best time for sowing, but it may also be done at all seasons of the year with satisfactory results. A fortnight or three weeks after collecting is a good time. The pots or pans in which the spores are sown should be filled to within an inch of the top with crocks, placing the smallest pieces at the top, and over this spread a layer of sterilised soil; that is, finely sifted loam, burnt to a red heat on an old shovel to kill anything likely to injure the germination of the spores. Before sowing dip the pot or pan almost to the rim in water to saturate the contents, taking care not to allow the water to come over the side. Scatter the spores thinly over the surface, covering each with a sheet of glass. Stand them in saucers of water; these, if filled every day, will keep the soil moist. Place them in a shady position in a frame or window, until germination commences, when more light may be given, and air gradually admitted. When large enough to move conveniently little patches of the seedlings should be pricked off into pans or shallow boxes, half an inch or so apart. As soon as several leaves have developed, the young plants can be potted off singly or several together, as may be desired.

Division of the plant is the method of propagation when only a few plants are required, or with sorts which do not produce spores, as, for instance, the beautiful Adiantum Farleyense. This is usually done in spring.

Nephrolepises are readily increased by division of the crown. The rhizome or root-stalk may readily be divided in the spring when the plants are repotted, or small pieces with a few roots may be detached from the parent plant. Many of the Davallias and Polypodiums are increased in this way; the Hares-foot Fern (Davallia Canariensis) is a good example.

Some ferns, notably some of the Aspleniums, are increased by bulbils, which are produced on the fronds. The fronds may be pegged down in pans filled with light soil, sprinkling a little over some parts of the frond, leaving it attached to the parent plant till well-rooted. This is the safest method; but if circumstances will not permit of its being done the fronds may be detached and pegged down in a similar way, placing the pan in a close frame for a week or two. Failing this the largest of the young plants growing on the frond can be taken off, and pricked into pans, starting them in a close frame, as advised above.

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Spade and Fork Work.

Spades are first-class tools for digging on light soils or on land that is very firm, but for heavy clinging loams, in a rather moist and soft condition, use a three-pronged fork, with broad prongs. To be ordered to dig some land with a spade, would be enough to make a man go on strike. Some people whose soil is always suitable for spade work, try to make us believe that the spade is the only real digging tool, but, there is no use in making gardening a torture, when there are tools which will materially lessen the labour and do the work equally as well, if not better.

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Glasshouse Washing.

Winter being the least busy season of the year is generally chosen by gardeners for the annual spring cleaning. If plants are to be grown in a clean and healthy manner, the houses in which they are cultivated must also be kept clean, and should be thoroughly washed at least once a year. If possible the house should be emptied of all its plants, but if this is impracticable, one end should be cleared and washed first, afterwards removing the plants to the clean end while the other part is being done. A small handful of soft soap should be well mixed in a bucketful of water, and a little syringed on a portion of the house. Be careful to do the highest parts first, which should then be well washed with a scrubbing brush, not forgetting the glass, for which a softer brush will be found useful. Odd corners, the breeding places of insects, must not be overlooked, and the whole should then be syringed with clean water.

Too much should not be attempted at once, as the syringing with clear water must be done before the part scrubbed has had time to dry, and should the day be sunny this takes but a very short time. A dull day is best chosen for the operation, as the glass is difficult to clean when the sun is shining brightly. The stages should be scrubbed, thoroughly overhauled, and repaired, if necessary. The ashes or gravel, if any, should be washed, or better still, renewed, as the old is almost sure to contain woodlice, slugs, and many other insect pests. Having finished washing the house, the plants should be the next consideration.

Any creepers on the roof, which of course have been taken down during the washing, should be sponged with soft soap or some insecticide before being again tied up. If the season is suitable for pruning, this is best done at the same time. The pot plants should then be carefully cleaned, sponging if necessary, their pots washed, afterwards arranging them as tastefully as possible. The trouble taken will be amply compensated for by the improved appearance and increased vigour of the plants in their clean surroundings.

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HAS SIXTEEN ADDITIONAL BEDROOMS,
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Gentians.

Blue is the least common of garden colours but it is also very beautiful. A lovely shade is found in the Gentian. The raising of Gentians from seed is quite easy, provided one or two matters are well attended to. Many people do not grow Gentians because they say seed raising is so slow and tedious, whilst plants are somewhat expensive. But surely it is worth waiting a little when the results are so beautiful.

Now a few words as to cultivation. When you have sown your seed, say in early September, you must not expect it to germinate in a few days for weeks may pass before the seeds appear. Sow the seeds thinly in pans of light sandy soil covering very lightly, and placing a piece of darkened glass over the pans to stop evaporation. When the plants appear let them remain in the seed pans until they are large enough to be easily handled, and then plant out in their permanent quarters. If the seed is sown thinly the plants may remain in the pans for about twelve months for they make slow growth and are quite small when full grown. The best position for Gentians is a sunny one, with at least 12 in. of good soil. Good drainage is essential, with ample moisture in spring and summer; but by far the most important thing of all is firm planting; in fact, in firm planting lies the secret of successful cultivation. When you have planted the plants tread them in firmly, and it is a good plan to pass an ordinary garden roller once or twice over the bed. The soil should be composed of light sandy loam, and in the case of heavy soils some old mortar and the addition of sand are helpful. Water plentifully during spring and summer, and there will be no failures.

Plant Enemies.

— How to Eradicate Them. —

Ants can be expelled from any place by pouring a little petroleum in their nests, and to prevent them climbing a tree or wall, place on a band of tar.

Birds are very often destructive to new growths and seedlings, and to protect these, lines of black thread should be stretched over and across them; when the birds touch this they fly away frightened.

Caterpillars are extremely fond of Roses, and should be sought for in every curled leaf and destroyed.

Club is a disease mostly affecting plants of the Cabbage species. Where it is present, thoroughly dig the soil and top dress with lime.

Earwigs can be trapped by inverted pots on the top of sticks, inserted in the ground among the plants, each pot containing a little dry moss in which the insects hide; these should be shaken out into boiling water and so destroyed, or shaken out on the ground and a firm foot placed upon them.

Greenfly in the greenhouse can easily be destroyed by fumigation. If outdoors, make the following insecticide: A quarter of a pound of quassia chips, boiled for a quarter of an hour, in a gallon of water, adding a quarter of a pound of soft soap, and mixing well. Syringe the plants affected with this, and a few hours after syringe with clear water.

Gooseberry caterpillar can be removed by dusting the trees with hellebore powder, but it is very poisonous, and should not be used where children are apt to play. Another remedy is to apply a good dusting of soot and lime, or to remove the surface soil and replace it with new. The insects in the old soil may be destroyed by mixing salt with it.

Wireworms are very fond of feeding on Carnations and other choice roots. To capture them, place pieces of raw Potato near the plants, for these are a luxury to the insects and should be daily renewed and the old pieces burnt.

The Annual Statices.

The word somehow reminds one more of a census paper than of the fragrant old fashioned lavender which nevertheless is properly called Statice arborea, this is, of course, a perennial as is S. tartarica a white flowered variety, largely used in England for drying and the manufacture of those rather dreadful compositions of dyed flowers and dried grasses which used to be rather a favourite form of table decoration some years ago. In addition to the above there are several varieties of annual statices of which S. Bonduellii deserves chief mention chiefly on account of its colour, yellow being an unusal shade in this family. S. Sinuata is a fine blue, whilst a variety of it exists which is parti-coloured blue and white. Perhaps the best of these annuals is S. Suworowii which grows about 2 ft. high, carries rosy purple flowers and is very free blooming besides being of rather graceful growth.

Annual Statices will produce capital heads, and furnish an ample supply of decorative flowers if they are sown early, and afforded liberal treatment from beginning to end of their existence.

Sow the seed in light, sandy soil. The boxes or pans should be placed in a sheltered position out of doors. The young seedlings must be kept moving in fresh, sweet soil, until they may be planted in the open. A well-dug and manured soil is necessary, and during the growing season the plants must not be allowed to suffer for want of water. Frequent supplies of liquid manure will have a wonderful effect upon the size and substance of the flowers, and when thus well grown the annual Statices produce a quantity of really useful bloom.

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POTATO DISEASES.

As a preventative to the spread of POTATO BLIGHT (Irish blight) SCAB, BROWN RUST, etc., Immerse all seed potatoes in SICKLE BRAND FORMALIN 1 lb. to 32 gallons water. Soak uncut tubers in the solution for 2 hours, spread out to dry, cut and plant as usual. It is important not to cut tubers before treatment.

PRICES:

1/6 per 1 lb. bottle, 14/- per gallon bottle, 12/6 per gal. in 3 gallon jars, 1 gallon — about 11½ lbs.

Sole Agents for South Australia:

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CURRIE STREET.

Thrips.

A very valuable bulletin, the result of long and careful investigation has being prepared by the Illinois Agricultural Experiment Station.

Following is a summary of the contents.

Thrips are very small winged, sucking insects which lay their eggs in the green parts of plants.

Eggs are laid inside the calyx of carnations, on the outside of the calyx of the rose, and in the tissues of the lower side of the leaf of cucumbers.

Injury is caused by withdrawal of the sap from the cells of the petals and leaves of plants, leaving white blotches on colored flowers, causing a browning of petals of white or light pink flowers, and a gray hoary appearance to leaves.

All species of thrips are more or less sensitive to bright sunlight and generally seek shaded positions.

Conditions favorable to red spider are favorable to thrips.

Thrips injury is greatest in autumn and spring and least in midwinter.

Fumigation is slightly more effective than sprays.

Hydrocyanic acid gas, one ounce to each 1,000 cubic feet of space is dangerous to young cucumber plants but sufficient to destroy an average of 92 per cent. of the thrips. This is, of course, for glasshouse work.

Hydrocyanic acid gas, one ounce to each 3,000 cubic feet of space destroyed whitefly, but only eleven per cent. of thrips, while it did not injure the plants.

Daily sprayings with nicotine insecticide on the upper surfaces of the leaves and the spray syringed off gave good practical results. Spraying thoroughly will clean out thrips provided the plants will stand the hard syringing necssary to remove the spray.

Tobacco smoke is not a very efficient insecticide for thrips.

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Some Garden Data.

Egypt can claim the earliest historical garden.

The Persians, according to Xenophon, "cultivated their garden for beauty as well as fruit."

The Greeks copied from the Persians their manner of making gardens.

There were many celebrated Roman gardens. That of Targuinius Superbus is mentioned in history as early as 534 B.C.

Before the Roman Conquest gardens were unknown in England. "The people of Britain," writes Strabo, "are generally ignorant of the art of cultivating gardens."

The earliest actual record in England of monastic gardens is in the 11th century.

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The Viola Family.

A correspondent to "The Gardening World," writes :—

The amateur is often puzzled to differentiate between the members of the Violaceae, and thus loses the pleasure of knowing their proper place and value. For his guidance I will now describe them. They are all hardy perennials, although sometimes it is necessary to use shelter and glass to secure special results of the highest value for the gardens of the rich. They also are an inexpensive glory for the gardens and window boxes of the poor. For specimens, for borders, for bedding they are more than desirable.

Pansies or Heartsease are divided into the following groups, each of which may be further classified as self, blotched, margined, shaded, multi-coloured and variegated :—

Border Pansies.—I select this name for Pansies in general, which do not belong to the following sections—or possibly decorative may be a better title. They grow and flower very freely.

Show Pansies have circular blooms flat and smooth, without crinkly edges, and thickly velvety petals lying closely over each other. The three lower petals have a ground or principal colour of pure white or pure yellow, an orange eye, dark circular blotch in centre of blooms, dark narrow belt to three lower petals of the same colour as upper petals ; diameter 1½ inch. They are smaller and less brilliant than the Fancies, but are well worthy of a place in every garden.

Fancy Pansies have circular blooms flat and smooth, with wavy or crinkled edges ; petals thick and velvety, lying closely over each other ; solid bright orange eye ; large blotches of colour with a narrow belt or margin of another colour on the three lower petals. The top petals are coloured, similar to the margin, but this colour is sometimes suffused. The diameter is 1½ to 2 inches. These include reds, bronzes, browns, violets, whites, blues, and yellows, and all the more important tints.

Trimardeau Giants are French Pansies, noted for coarse blooms and gaudy colours. They make a fine display where these points are desired.

Violas or Tufted Pansies are hybrids of the ordinary Pansy and the horned Violet. They are continuous bloomers. There are large-sized and miniature types. They are most effective for carpeting amongst Roses and other large plants, for bedding, for edging, for masses on rockwork, and for exhibition.

For bedding, select the dwarfest varieties which are very compact, free, and with flowers well above the foliage. They may be either round or oblong, with or without rays, and of a bright telling colour.

For Exhibition the flowers may be of one or more colours, of good texture, as nearly round as possible, not under 1½ inches diameter, with or without rays.

The Violet, Viola odorata, or Sweet Violet, is too well known to need much description. Comte de Brazza and Neapolitan are double. California is a handsome late single, which deserves attention. Czar is single white or single dark purple. Devoniensis is single deep blue. The above are the best. La France bears on long stiff stalks handsome single metallic blue flowers, the size of a florin. It has a very hardy robust habit. For quiet, restful beauty, for length of flowering, and for decorative effect, no flowers surpass the Viola family.

W. H. PENGILLY'S
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FULLARTON, S.A.

Fruit Trees.

all the leading varieties, well grown, and well-rooted. Peaches, Apricots, Plums, Quinces, Figs, Almonds, Vines best table varieties.

I have again to offer the finest grown lot of Standards and Dwarf Roses in this State.

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Blue Hydrangeas.

Few subjects have aroused more controversy than the production of blue flowers on the common Hydrangea. Very occasionally the predominant colour is blue, while in others the blossoms are wholly pink. The change is then put down to the differences in the chemical qualities of the soil. That the presence of iron in the soil causes the blue flowers is an often-expressed opinion, and, by mixing iron refuse from the blacksmith's force with the soil in which the plants are potted, some cultivators have succeeded in obtaining flowers of a beautiful blue tint. Perhaps the greatest measure of success has been obtained by watering the plants with alum water, but even then that beautiful blue colour to be seen occasionally out of doors does not always result therefrom. The alum should be crushed and dissolved in hot water to the extent of 1oz. to a gallon of water. This mixture must be given just as the flower trusses show, watering them with it at intervals of eight or ten days, and discontinuing it when the flowers begin to open. It must not be applied when the roots are dry. Though blue flowers are sometimes produced under cultivation, it must be confessed that the why and wherefore of the matter is still a subject for conjecture. A year or two ago a gardener in the hills had a very fine show of blues, but when cuttings were struck a reversion to pink took place.

RESIDENTS
of Keswick, Richmond, and surrounding districts can obtain all they require from the
POST OFFICE STORE, KESWICK
(Bay Road).
J. H. COOMBE, Proprietor.

Essentials in Hybridization.

The first requisite in plant-breeding is the fundamental one that brains must be freely drawn upon if any success is to be expected in the production of new things. Indiscriminate guess work is practically useless in hybridization. An intelligent purpose, intelligently followed, through methods intelligently chosen, is the only road worth travelling. And the paramount quality which must be retained and reinforced in every operation is stamina. Constitution must stand first, for, if it is scarificed in the least degree, eventual failure is a certainty. The history of plant hybridization is strewn with the defunct relics of productions, beautiful and promising in every other respect, but deficient in this one essential. The weakling is doomed from the start.

Mr. H. S. Chapman, of 258 Market Buildings, Rundle Street East is a thoroughly practical watchmaker and manufacturing jeweller from whom goods may be procured, with every confidence. Mr. Chapman makes a specialty of remodelling old jewellery to any design, a class of work in which he has proved very successful. Stones are re-set and engraving, gilding and electroplating carefully carried out. Country orders receive prompt attention.

The Orchard.

Orchard Shelter Belts.

By E. E. Pescott, Vic. Journal of Agriculture.

Notwithstanding the fact that the type of fruit tree generally in cultivation in this State is one that has been framed with a low crown, partly with the object of placing the fruit where it would receive protection from winds, there is a necessity in many districts for still further protection; and this necessity can only be met by the planting of shelter belts. There are also many soils, especially in the level northern areas, and wind-swept plains, where fruit-growing would be impossible but for such plantations. The presence of irrigation channels, intersecting orchards and orchard districts, provides suitable land for planting hedges, in addition to those which may be planted on the outside boundaries of the estate. In some districts, the Osier Willow has been planted on the channel banks for shelter purposes, but in the space of a very few years, the roots become a serious menace to the waterflow.

Shelter belts are of two classes, viz., those planted purely for shelter, and those which in addition to providing shelter, also are of some profit to the grower, by the producing of a commercial product. Of the latter class are the Almond, the Fig, and the Black Achan Pear.

The most essential point to be considered in planting shelter belts, after their use as shelter has been decided, is the question as to whether the plant or tree selected requires much or little feeding; or, in other words, whether the growth of the shelter belt will reduce the production of the fruit trees adjacent to it. Pepper trees, Pine trees, and the African Box Thorn are undoubtedly excessively gross feeders, and should never be planted in close proximity to the orchard. The roots of these trees and plants will extend and feed at a distance of 30 to 40 feet from their base; and they considerably deplete the soil of large quantities of organic plant foods.

The Sugar Gum (Eucalyptus corynocalyx) is a considerably less gross feeder then these, but it is more difficult to manage, and unless topped and thinned in its early growth, it is not clothed with foliage and growth where these are necessary.

Among the useful plants for hedge and shelter purposes is the Kaffir or Kai Apple. This is a native of South-eastern Africa, and is not at all difficult to grow. It rather requires a small quantity of water, and is not a gross feeder. Unfortunately, it is not always of a quick growth, but it is of a sturdy habit, and is densely covered with long firm thorns; by reason of this feature, it is very valuable as a protection to the orchard. In some localities, it yields a golden-coloured edible fruit.

The Tagasaste, or Tree Lucerne, is also a useful hedge and shelter plant, but it is liable to be destroyed by stock, and this reduces its value as a shelter belt, unless it can be effectively protected.

A most useful plant or tree for shelter and protection purposes is the Osage Orange. This tree is a native of North America. It easily becomes a fine spreading tree up to 60 feet in height; but it may readily be kept at any required height by cutting.

When grown as a hedge, the occasional cuttings cause it to produce a very dense, impenetrable growth, the annual growth being sometimes 4 and 5 feet in length. The plant carries very numerous large spines, which add to its value as a hedge. It is not at all exhausting on the soil. At Bacchus Marsh, both apple trees and lucerne grow successfully in close proximity to a wind-break of osage orange which is fully 60 feet in height. It is easily grown from seed; and if grown in seed beds or boxes, may be planted out the first year after sowing.

Before planting out any hedge or breakwind it is absolutely necessary to deeply trench and subsoil the land. If this be done, the roots have a freer running space, and are able to penetrate and travel quickly through the soil.

Value of Burned Soil.

English gardeners who live in parts of the country where clay forms the surface soil have learned the value of burning a portion of it to improve the rest. The clay that is burned gives quantities of potash, lime, and other mineral elements of plant food. The mechanical improvement would explain, however, the great value of adding burned clay to a heavy soil. It increases the porosity of the soil, permitting it to become better aerated, and where air and rain can thus readily penetrate the soil, it is more quickly affected by the action of the sun when the temperature rises in spring than soils that are heavy, close, and retentive of moisture.

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Vegetable Notes for August.

The nature of the work in any garden and any given locality must of necessity depend largely on the special conditions of soil and situation. A few yards distance, or the difference between clay and sandy soil, may make several weeks difference in the necessary operations. The climate of a garden may be very largely changed by a breakwind, while the mere slope of the ground may make a difference of a week or ten days in all operations.

The present is a very busy time in the earlier districts, but in colder, later parts very little can be done except to get ready for September planting.

Artichoke (Globe).—It is not too late to plant out suckers for this year, and seed may be sown to produce plants for next season.

Jerusalem and Chinese Artichokes.—If not done these should be dug and used or stored in slightly moist sand. The sets for next crop should be planted this month, like potatoes, in rows 2ft. apart and 18in. apart in the rows.

Asparagus.—Old beds must not be neglected and new ones may still be planted, as previously described. In brief, double-dig the land, putting in plenty of manure, artificial and natural. Plant sets of two-year-old plants 1ft. apart in rows 18in. apart. Dress old beds, if it has not been done before, with a sprinkling of kainit, a good dressing of superphosphate, and a sprinkling of sulphate of ammonia. Fork up the surface lightly and mulch with short seaweed if possible, or failing that, short stable litter. Seed beds for plants to put out two years hence may be sown now.

Beans.—It is late now for broad beans in dry, hot districts, but they should be sown in late localities. Wherever experience has shown or judgment indicates that it is safe to do so, successive sowings of dwarf French beans should be made at intervals of a fortnight. This is one of the most useful kitchen garden crops, and one which can be grown almost anywhere. In the warmer, sandy places if sown now early crops will be obtained without water, and wherever water is available, by making successive sowings, a supply can be kept up until April or May. Plant in drills 2ft. apart and 4in. apart in the rows. For manure give a cupful of superphosphate for every row 16ft. long, and mix it well with the soil before planting.

Beet.—Thin out and hoe previously sown beds, and if desired make fresh sowings of red and silver beet. It is an excellent plan to have a bed of white beet, for it will grow all through the summer with water, and apart from its use as a vegetable, it is about the best green stuff to give fowls in the summer.

Broccoli.—Set out plants if it has not been already done. In favorable localities a sowing of seed should be made.

Cabbage.—It is too late for sowing seed on the plains. But beds should be put in in late cool districts. In suitable cool situations beds of well-grown plants may yet be put out on the plains. Keep the ground well hoed, and before rain or before watering sprinklings of sulphate of ammonia may be applied to the beds. The Drumhead varieties are best for late planting.

Cape Gooseberry.—Sow seeds in warm beds under glass the same as tomatoes.

Capsicums.—Sow in the same way as tomatoes.

Carrots and parsnips.—In later districts sow liberally at the end of the month.

Cauliflower.—Sow seed beds in hills. It is too late to attempt to grow this crop on the plains.

Celery.—Sow seeds in the hills and earth up, and water plants as required on the plains.

Chicory.—Sow in the hills. Light, deep, sandy soil is necessary for good crops.

Cucumber.—Those planted in hot beds last month must be carefully attended to and kept growing. Make successive sowing in the hot beds. In favorable localities sowings may be attempted in the open at the end of the month, especially if a hole, say, 2ft. across and a foot deep, be dug and nearly filled with stable manure a week or two old, which has been well stirred. Cover with 4in. of light soil and plant the seeds. Put in pegs 6in. high all round, and throw a bag over until the seeds commence to come up, and every night after until the weather gets warmer. It is, of course, still better to make a few frames of flooring board or palings the size of the bed, and stretch calico over the top. These are put on at nights in cold weather and taken off in warm weather.

Egg Plant.—Treat the same as tomatoes.

Endive.—Tie up those ready for blanching, and in the hills make sowings of seed.

Kohl-Rabi.—This is a turnip-rooted cabbage, and may be sown now in seed beds in the cooler districts. It is late for the plains.

Leek.—Plant out in trenches similar to celery.

Lettuce, Cress, and Mustard and other salad plants should be sown successively.

Melons.—What was said of cucumbers will equally apply to this crop. It is important that care be taken that the plants do not receive a check.

Onion.—Seed beds for the main crop in the cooler districts may be sown at once if not already done. Beds may still be planted out on the plains.

Rhubarb.—New beds should be made without delay and seed sown in well-prepared beds.

Salsify, or Vegetable Oyster.—Sow in drills 2ft. apart and treat the same as carrots.

Seakale.—Seed may be sown in early localities. Beds should be planted at once. Covers may be put out over plants.

Spinach. — Sowings may be made where the conditions will allow of its maturing. Beds may be sown in the cooler districts at the end of the month. Plant New Zealand spinach where water is available.

Peas.—Spring crops may be sown now of quick-growing sorts. It is, however, late for warm localities. Make good sowings in the cooler districts.

Parsley.—This is best sown in edgings. Seed may be put in now.

Potatoes.—Good plantings may be made at once, and if the seed be well sprouted and the soil good

THE GREAT NERVE AND BLOOD REMEDY. CLEMENTS TONIC AGAIN PROVES ITS VALUE IN THE REMARKABLE CASE OF MRS. ANDERSON.

Much has been written concerning the martyrdom of women to bear burdens from which the bravest man may well be grateful for being excluded.

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the crop will be ready in November. In districts subject to frost, a month hence is time enough.

Pumpkins.—Treat the same as melons and cucumbers.

Sweet Potato.—Tubers may be planted in a hot bed to raise sets for planting out later. They require a sandy soil and warm situation.

Turnips.—Make sowings in cooler localities.

Tomato.—The early plants raised last month in hot beds are now ready for pricking out in 4-in. pots, which should be kept under glass. For early fruit rather starve the plants, but keep them warm. Use slightly warm water and water sparingly. It is yet early enough for most people to plant in hot beds, and at the end of the month plants may be set out in warm localities if well protected, as described for cucumber plants.

Frames.

The raising of early summer plants, whether for the flower or vegetable garden and the striking of cuttings is very much simplified by the possession of one or more of these handy aids to successful gardening. They may be more or less permanent structures of somewhat elaborate design or simple, inexpensive makeshifts which can be moved about and be useful throughout the year, but especially in winter and early spring when some protection must be provided if the gardener is going to raise early stuff. Just at present they will be indispensable for best results with the more tender annuals for the front garden as well as for melons, cucumbers, etc., for the vegetable portion. The simplest form of frame is the bottomless box, the front of which should have less depth than the back, so that the top will, in consequence, have a sloping form. The top is glazed, in a small frame being in one sash, an old window frame being admirably adapted for this purpose, but in large and more ornate ones there may be several, each being capable of being moved independently of the other, so that any one sash may be opened or all opened together. The frame thus constructed is placed on a heap of short stable manure, in the preparation of which much of the usefulness of the frame depends. The manure should not be too fresh, but should have lain some time in the heap. If perfectly fresh manure is all that is procurable, it may be used with perfect safety if mixed with an equal quantity of leaves taken from the compost heap. It will be found a good practice and safe. The particles of manure should be well separated, so that no matted clumps be found in it. Stake out on the ground the exact size of your frame, with an allowance of six inches all round. Within the spot staked off, the manure is placed, being kept in its place by means of boards or pieces of galvanized iron. The best way to put the manure in is to shake it in lightly and evenly with a fork, and when about six inches deep beat it down with the spade. Then shake in another six inches and treat in the same way, and continue until the manure is four feet deep. Place the frame on top of this with the top closed. The heat from the fermentation of the dung will soon commence to rise, and before placing on top the covering of soil be absolutely sure it is not too hot. This can be ascertained by plunging a clean stick into the centre, and if on withdrawing it and grasping it, it scalds the hand the bed is too hot, but if you can hold it the bed may be considered fit to receive the plants. The covering of light sandy loam in which the plants are to be raised, or the pots containing plants bedded, should be not less than six or eight inches deep.

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How to Plant Cuttings.

Many mistakes are made in planting cuttings. They leave three-fourths of the length of the cutting above ground, and very often push the cutting down by main force into the soil. The most successful way is to make cuttings from 6in. to 12in. long, inserting them by means of a "dibber"—usually the handle of an old spade or shovel, cut a foot in length and sharpened—to such a depth that only about two eyes or buds are exposed above ground. The injury done by forcibly pushing the cutting down into the soil is that the bark is bruised around the base of the cutting where the root-forming callus emerges. If this bruising takes place decay begins, the callus does not form, and the cuttings perish. This suggestion should be observed in making cuttings off any kind of plant. It should also be remembered that the secret of getting cuttings to strike is to firm the soil round the extreme base or bottom of the cutting. For this reason to make a trench, made with a slightly sloping side and of the required depth, is the better way. The cuttings are laid along this side, and the soil filled in and pressed with the foot firmly against the base of the cutting. The top soil is left loose.

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Colouring of Lemons and Oranges by the Sweating Process.

By W. J. Allen in N.S.W. Agricultural Gazette.

During the last few years the growers of this State have planted a good many thousand Late Valencia orange trees, a variety which ripens late and hangs particularly well. The trees which are bearing are carrying good crops of fruit, which finds a ready market at remunerative prices. As December approaches, it has been found that the fruit loses its bright orange colour, and reverts to its original green. This in no way affects the flavour of the fruit, but the public will not pay the same price for a green orange, even though it be ripe, as they will for a good, bright orange-coloured orange; hence the necessity for colouring fruit which may have been allowed to hang until it has lost its proper colour and reverted to green. Lemons which are fairly well matured and of good size, may also be coloured in a somewhat similar manner as that to which the oranges are subjected.

While in California a few years ago I visited several large packing-houses where the colouring of fruit was being carried out, and it was a decided success. At the California Convention of Fruit-growers, held in Pomona last year, Mr. L. B. Williams, of Whittier, California, read a paper on the above subject, and I do not think I could do better than give his process in his own words:—

"Our first sweat-room consisted of a small room, single wall, paper-lined, large enough to accommodate one car of fruit at a time. This room was in the main building; in fact, it constituted the largest per cent. of the main building at that time. The fruit was washed and placed in our picking-boxes, and trucked into this room, stacked ten boxes high, papering the top box.

"When the room was filled, or nearly so, it was heated with kerosene stoves. The first stove was the kerosene drip stove; next we used the 'Perfection B,' also Perfection No. 813b, which is the same stove as far as the writer can see. The temperature of the room was held at 90 degrees as near as possible, this being the maximum. The temperature was regulated by the number of burners in the room. It was necessary to keep the fruit moist to keep it from wilting. This was done from evaporation by placing a vessel on the stove and filling it with water, the amount of moisture depending upon the number of burners required for the temperature, so the moisture at this time automatically adjusted itself.

"If we wished the fruit coloured quickly, this process would continue day and night. Our pickings increased until it was necessary to have more sweating accommodation. Not being satisfied with all conditions, and believing that improvement was soon at hand, we decided not to build just then, so we moved out into our regular storing tents, using the kerosene stoves for heat in the same way, only more of them were required considering temperature only.

"Having more room and fruit, it was necessary to have more stoves. The old Perfection B had had its day, and the new Perfection taken its place, consequently we purchased new Perfection. We soon discovered the new stove did not colour the fruit. It gave off the same amount of heat, also evaporated the same amount of water, was much nicer to manipulate, but decidedly slower to colour. Very often we were required to make a change, taking out the new stoves and replacing them with the old in order to complete the job. The old stoves threw off a large column of pungent gas. This being the only difference we could see, led us to believe that there was some virtue in the pungent gas. We also discovered that we could shorten the time of colouring in tents by making them two thicknesses, placing one over the other, thus more closely confining this pungent gas.

"We carried on a few small experiments at this time which served to strengthen our opinion that this pungent gas was an important factor in colouring oranges and lemons.

"While sweating in the room and tents, the stoves were on the same floor with the fruit. This had several objectionable features, namely, the fruit would not colour in the bottom box as soon as in the top. They had to be turned out, and removed every time we trucked fruit in. This was dangerous, as the stoves were liable to be struck with the trucks, causing leaks of fire.

"Feeling the need of better accommodation, and having in mind all the points we had picked up from past experience, we planned to build a new sweat-house, one that would cover all the good points and overcome the most objectionable ones. We also decided to build as nearly fireproof as possible, independent of the main building, and thus eliminate the danger of fire, especially to the main building. We at this time

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had the good fortune of having an assistant to help plan and build such a sweat house, this party having had successful experience in firing from the basement. This basement idea would overcome the objectionable feature of having the stoves on the same floor.

— Description of the Sweat-House. —

"We first staked out a piece of ground, 42 feet by 46 feet, inside measurement, being sufficient for six rooms 14 by 20. We excavated for each room, making a basement 12 feet by 18 feet at top, allowing it to taper at about 45 degrees, 6 feet in depth, which gave us 5 feet by 8 feet 6 inches at the bottom for stove floor. The tapering wall prevented it from crumbling, and gave sufficient strength to carry foundation and partition walls. We excavated an aisle, 4 feet 6 inches, tapering to 3 feet at the bottom, and running lengthways of the building. There are three rooms on each side of the aisle with doors entering from the aisle, which enables us to go into the several rooms independent of each other.

"Water is piped to each room. There is electric wiring in conduit throughout the building. Also, allow me to mention, in passing, that two fire escapes have been wisely provided, in addition to the main stairway, making a total of three possible ways for a man to escape in case of fire.

"Now we come to the upper rooms. The main outside walls are of concrete, 6 inches thick, 8 feet high, with a small window in each room. The ceilings and partitions are of 1-inch tongued and grooved redwood. A 6-foot aisle runs lengthways of the building, with doors the full width of the aisle at each end. There are three rooms 14 feet by 20 feet on each side of the aisle, each room independent of the other. The floor is made of 2 in. x 6 in. Oregon pine, laid with ½-inch openings between each, affording ample room for the heat and gas to come through. The gables are ceiled with 1-inch rough Oregon pine, covered on the outside with sheet-iron. There are three doors in each gable, which allow a large per cent. of natural heat to escape. They are so arranged that by pulling a small cable in or out of sweat-house they can be unlatched, closed, and latched. This was provided so that in case of fire they can be quickly shut, which would protect the sweat-house from any outside fire. In case of the fire starting in the sweat-house, this would confine it to same, and protect the outside buildings. The roof is of galvanized sheet-iron, with vent in top. This vent can also be closed by pulling a small cable.

"There is a 5ft. by 8ft. galvanized sheet-iron secured to the upper and under the main floor over the burners in the basement, to prevent flames or the heat coming direct on the fruit, in case we are not using vessels on the stoves.

"Now for the colouring of the fruit. We find we have better results by treating oranges and lemons differently. I will speak of the oranges first. The green and yellow are separated at the washer, placed in packing-cases stacked eight high, the fruit in the top case being covered with paper. The fruit is then trucked into the sweat-room, trucking the dark green in first and placing it farthest from the door. The rooms being 14 by 20 afford ample room for one car, or 600 packing-cases to each room. The boxes stacked eight high prevent re-stacking in the sweat-room. The fruit is trucked five rows in each room, 120 boxes to a row, and 5 inches space between each row, thus allowing room for the removal of the clamp trucks. The fruit is set in with a small space left between each stack, say 1 to 1½ inches, which is ample room for the heat and gas to equally distribute itself. Having the stoves down in the basement makes it possible to truck fruit in and out of sweat-room without disturbing same. They are low enough to afford uniform colouring top and bottom, holding the temperature of the room at about 100 degrees as nearly as possible being the maximum. Moisture is used sparingly. We have not been able to secure a hygrometer that will give us sufficient accuracy in the sweat-room to be able to establish a fixed humidity, so we are compelled to go by observation. We supply our moisture from evaporation, using just enough to keep the fruit from wilting, and watching that there are no beads of water collecting on the fruit or ceiling, working for reddish orange colour. The colour is improved by quick action, firing continually until well coloured.

"Now, the sweating of lemons. You will note the difference in temperature, humidity, and time allowed to colour. If the sweat-room has stood with long intervals between usage, we go into the room, thoroughly wetting the walls, ceiling, and floor before we allow any fruit to go in. First washing the fruit, we divide the green fruit into three or more shades—dark green, light dark green, dark light green, and light green. We think it is impossible to put too much care upon this important matter at the washer, consequently we see that there is a competent hand at this place. If this classifying is well done, the fruit can be handled in such a way as to receive the best results from the room.

"I might say here that at this time of the year, or when we are getting a per cent. of the new crop, and a small per cent. of the heavy dark green is rough and coarse, if it is stored elsewhere for about ten days before going into the sweat, it will improve both in colour and quality.

"The lemons are trucked into sweat-room from washer, trucking in the dark shades first, lighter shades next, and working the lighter shades to the door, as the light green colours should come out first, thus allowing the fruit to be uniformly coloured. We find a difference of twelve to twenty-four hours in the time required to colour the different shades. In firing from the base-

TRY HARDY'S FAMOUS WINES

ment we endeavour to produce all the gas we can, paying close attention to the temperature, and holding it as nearly as possible to 90 degrees, this being the maximum. Lemons require much more moisture than oranges, and should have a sufficient amount not only to prevent wilting, but to prevent the heat from baking the colour to a ripish or dark yellow. In lemons we work at all times for a whitish yellow. The humidity can vary to quite an extent before there is too much, but I am unable to say just what per cent. But to speak again from observation, there must be beads collecting on the ceiling and fruit. This moisture is supplied by evaporation. Occasionally we have a room of fruit that drinks up all the moisture we can supply by previous sprinkling and evaporation. When this condition presents itself, we attach the hose to hydrants in the basement and wet the fruit down, soaking everything in the room. We also go down and sprinkle the walls heavily.

"A much better colour is secured if more time is given to the sweating, say firing at intervals instead of firing continually.

"We have carried on various experiments, working with hopes that we could discover a way by which lemons could be quickly coloured and retain their buttons. Results of our work so far have proved that this combination cannot be accomplished, but can be done separately. The buttons will not drop off if much more than the ordinary time is given to colour. Our experiments served to strengthen our conclusion that the pungent gas was the prime factor in colouring the fruit, also was the whole factor in throwing the buttons, while, as I have said, if a small quantity of gas is put to the fruit it will colour it in time and not throw all the buttons, but a large volume of gas will hasten the colour but throw the buttons, very often before the fruit commences to colour.

"It will be the pleasure of the Bureau of Plant Industry to hand out a circular giving the particulars of all experiments and results carried on during two seasons while here. This will be done in time. I wish to say that we carried on sufficient experiments to place us in a position where we could see that we were in a large field—room for difference of opinion under the same conditions. The cause underlying this great difference is not fully understood at present, but the results of the experiments so far invite a more interesting study of the sweat-room.

"In closing, I will say that I believe the time is near at hand when we will be able to generate our gases for a large amount of fruit from a small amount of fuel, thus reducing the cost of labour, cost of fuel, and last but not least, reduce the great danger of loss by fire."

The time is not far distant when our citrus growers will have to adopt this very simple method, and by a system of co-operation, one or two rooms could be fitted up in the main fruitgrowing centres, where one man could take charge of the work during the season or seasons when it might be found necessary to colour either green matured oranges or lemons. I am hoping to be able to carry on an experiment at Pera Bore during the coming fruit season, as a good many of our Late Valencias which are budded on lemon stock turn a green colour before we are ready to harvest them. The Late Valencias growing on the orange stock do not turn nearly so green nor as early as do oranges on trees worked on lemon stock.

About Soils.

Soil is the soft and loose upper layer of the earth's crust upon which plants depend for their nourishment. Soils are formed in one of two ways, either from the weathering and breaking down of rocks or from the decay of plants or animals, and most of them are produced by both, although the former has been the source of by far the greater bulk except peat. "Where do we find the best?" Look at a geological map, and you will note that the best lands lie along the edges of the great geological formation where geological agencies have caused a mixture of the various constituents; therefore we find that soils are improved by mixing with others.

Peat, for example, can be improved by being mixed with clay, or sand, clay with lime and sand, and sand with peat, clay and lime. Humus, or vegetable earths, are formed in great part of the remains of plants, and to a slight extent of animals. These belong to the more fertile soils. Experiments have shown that they absorb about half their own weight of water from air saturated with vapour, hence the value of these soils to gardeners. Peat soils are formed from the decay of acquatic and marsh plants, and are generally met with in bogs. These soils provide a most useful material in gardening operations, being used for the growing of Azaleas, Rhododendrons, Heaths, etc. Peat bogs can be rendered fertile by draining and mixing clay, lime, and sand with the peat.

Sandy soils are composed of about 80 per cent. of pure quartz, such as may be met with among the sand hills along the coast, and contains little nourishment for plants, which are liable to suffer from drought when planted in it. This can be improved by mixing with it clay, lime, and peat.

Clay soils are formed from the breaking down of felspars of granite and in rocks of similar composition, and these contain an abundance of mineral food for plants, but owing to their stiff texture it is rendered unavailable. Such soils are considered by gardeners as cold, late soils, but they can be improved by draining and mixing with sand and lime.

Calcareous soils contain about 20 per cent. of carbonate of lime in the form of chalk, or mixed with clay to form marls. They vary greatly in productiveness.

Loamy soils are chiefly composed of peat, clay, sand, and calcareous soils, clay being under 50 per cent. and lime of chalk under 5 per cent., the gardener being well acquainted with their value.

Vanilla Aromatica.

Being the only fruiting Orchid of any economic value in cultivation, this plant is one of the most interesting of tropical fruit, writes "The Garden." Grown on the back wall of a lean-to house facing south-east, with its main shoots trained close to the glass, it bears bunches of fine fruits, each bunch 6 inches to 9 inches in length and twelve to twenty fruits to a bunch. It requires very little soil to grow in, as it obtains nourishment by means of its long aerial roots. Like many other Orchids, it needs drying off in the winter months until it throws spikes for bloom; then it should be damped over twice daily until the flowers open. Great care must be taken to watch for the blooms, as they last but two or three hours and they must be artificially fertilised during that period. After all the flowers are set, syringing should take place again. When the pods are black and about three-quarters of an inch in length, they should be gathered and carefully folded (singly) in tissue paper in packets of twelve, tied up with cotton; then the pods will turn quite black, when they are fit for use.

Orchard Reminders.

Finish planting and pruning deciduous trees.

Graft apple stocks and prepare to graft other trees as the sap rises.

Use scions only from proved trees, healthy growers, and prolific bearers.

A light ploughing in the orchard or a forking around the trees in the fruit garden will keep down weeds, hold the water supplies, and air the soil.

Finish pruning the vines. Cut out all wood showing that it has been affected with oidium. If the trouble has been serious, swab the vines after pruning with iron sulphate and sulphuric acid.

Spraying with Bordeaux Mixture just before the blossom buds open is the standard remedy for all fungus diseases of stone fruits, such as leaf curl, shothole, rust, or blight.

Bordeaux in itself is not very adhesive so that if rain follows the spraying it will be necessary to repeat the application.

Aphis will be likely to give trouble unless the winter treatment of red oil spray was used. Kerosene emulsion or resin wash used freely as a spray two or three times at intervals of a few days, will greatly reduce the pest.

The remedy for scale trouble in citrus trees is either fumigation or the tobacco, kerosene or resin sprays.

If any grafting is to be done it should be remembered that for stocks up to the thickness of a man's finger the whip or tongue graft is best. For others up to 1in. in diameter the cleft graft will be found successful. Old limbs or trunks several inches in diameter are least injured if the crown or bark graft is used. If several scions are inserted around the edge of a large stump, the partial decay frequently noticed can be largely averted. The great essential to success consists in adjusting the cambium layers—not bark—so that they are in direct contact in both scion and stock. If a proper affinity exists between the stock and scion the sap will flow uninterruptedly from stock to scion, and the fusion of cells will be accomplished. When the scions are fixed the whole of the cut sections should be carefully covered with wax or clay to exclude dry air, etc.

The best time to plant oranges lemons, etc., will depend a good deal on the soil and situation. In a dry warm soil they can be planted earlier than in one which is cold and late.

In selecting trees from the nursery, procure small, healthy, deep green looking specimens. The time to transplant is perhaps best indicated by the buds in the axils of the leaves beginning to push out. If reasonable care is exercised in lifting them, no check occurs, but if allowed to make young shoots several inches long, the shifting will almost invariably result in the young growth dying off. It is not advisable to put large quantities of manure, etc., in the holes beneath citrus trees. If the soil has been impoverished, a barrow load of well-rotted stable manure may be mixed into the soil where each tree is to be set, at the time of planting, but it should not be applied unless thoroughly decomposed. The trees succeed best when planted fairly well out of the soil. Try to gauge the setting so that when the soil has settled into its ordinary position the crown of the roots—where they join the stem—is just visible, though not wholly uncovered.

Where green manure crops have been grown care should be taken that they are ploughed under sufficiently early for their decomposition and use by the trees and also to prevent the drying out of the soil which takes place if the crop is left too late.

Where manuring with artificial fertilizers is to be done this should be done this month. Two applications are better than one, especially with the more quickly available ones, such as nitrate of soda.

A good general manure for medium sized trees, normally carrying fair crops would be 3 lbs. superphosphate, 1½ lbs. sulphate of potash, and 1 lb. of sulphate of ammonia. If the trees are already very vigorous omit the last.

— How to Make Resin Wash. —

Resin, 10lbs.; washing soda, 10lbs.; fish oil, 1½pts. (if procurable; if not use soft soap, 5lbs.). Place the soda in a boiler with sufficient water to allow it to boil freely: when dissolved slowly add the oil or soft soap, and very gradually put in the finely powdered resin, and then boil together rapidly for one hour, adding a little boiling water occasionally, so that it does not boil over, then add 50galls. of water. This is effective against many kinds of scale insects.

— Tobacco and Soap Wash. —

Take from 4ozs. to 8ozs. tobacco, according to the strength of the sample available (the powdered form is best), and pour over it ¾gall. of hot water. In another quart of boiling water dissolve 2ozs. of soap (hard or soft will answer). Allow the tobacco to steep over night, and then, after straining out the sediment, mix the tobacco liquor with the soap solution. This is more effective if applied in a fairly hot condition.

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Bordeaux Mixture.

Copper sulphate (bluestone), 5 lbs.; quicklime (to be freshly slaked), 5 lbs.; water, 40 gallons.

Pulverise the bluestone and dissolve it in a wooden vessel containing half the quantity of water or 50 gallons. This can be simply done by tying the bluestone in a coarse sack, and suspending it just beneath the surface of the water by means of a stick laid across the top of the wooden vessel.

Slake the lime in a small quantity of water so as to get it as fine as possible, then add the remaining 50 gallons of water.

When cool, pour the milk of lime and copper solution slowly together into a barrel holding 100 gallons. The milk of lime should also be thoroughly agitated before and while pouring it out; and the mixture in the barrel should also be thoroughly stirred for several minutes.

To determine whether the mixture is safe to use on tender foliage, insert the blade of a penknife into it for at least a minute, and if copper is deposited on the steel more lime must be added until there is no deposit of copper.

Use the Bordeaux Mixture immediately after it is made.

Air-slaked lime should never be used in preparing Bordeaux Mixture, as the leaves are likely to be burnt.

By adding soft soap or treacle to the mixture equal to quantity of the bluestone used its adhesive property is increased.

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Dried Persimmons.

Whether the persimmon will ever become a popular fruit in South Australia is probably open to considerable doubt. We must confess that a fairly lengthy apprenticeship in the art of growing and eating them has not been without its disappointments on both counts. In and around Sydney the persimmon grows extremely well so that the fruit is plentiful and cheap.

So much is this the case that there is sometimes a difficulty in disposing of the crop. This has led to experimental work in drying, which has proved so successful that the hope is expressed that it may become a popular dessert fruit, for those who have tasted them vote the dried persimmon the primest of preserved fruits. In appearance the finished product resembles a fig and in flavour suggests the date. In a recent issue of the New South Wales Agricultural Gazette Messrs. Ray, of Epping, who following the suggestion of Mr. Vollmer, of the Epping Nurseries, first proved the possibility of drying this fruit, report the process as follows:—

"The fruit was taken from the trees while still quite firm, with portion of strig attached. It was then peeled, leaving the strig and a small surrounding piece of peel intact. It was suspended by string attached to the strigs, and placed in the sun until dried so that no moisture would exude upon pressure between the fingers. The fruit was then placed upon trays and dusted very lightly with castor sugar and placed in the sun. The next day it was turned and dusted with sugar on the other side. The drying process was then continued for a time, but not until it became hard and leathery. It was then packed in shallow boxes, and has kept splendidly. It is necessary that each fruit hang quite free whilst drying, for if placed upon trays in the first instance that part which comes into contact with the tray remains moist."

In conclusion the report states: "Judging by the sample submitted, Mr. W. J. Allen, Fruit Expert, considers that the persimmon when dried in this way is very much better than either figs or dates, and should command a high price in the market."

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Oranges.

Orange growers will be busy with their harvest, a harvest which from a monetary point of view is sometimes lessened by lack of reasonable care in gathering the fruit. The best way no doubt to pick all citrus fruit which are to be kept for any length of time is to cut rather than pull it off the tree, but even those who have "no time" for the slow and sure method might with advantage exercise more care in the picking process and the handling of the fruit. Oranges do not show the results of rough handling as quickly as more tender fruits but considerable damage is often done which discounts the value of the fruit to the eater and considering the price that the poor consumer has to pay for a decent orange it is only reasonable that the grower should do what is possible to let him have it in good condition. A bruise on the fruit will not show at once but it will quickly soften and decay. One or two spoiled fruit in a case would not greatly matter but unfortunately one rotting fruit will speedily infect its neighbours. It is certainly good policy to pick and pack carefully.

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Cold v. Warm Water for Plants.

(From Bulletin 92, U.S.A. Dept of Agriculture).

It is the generally accepted opinion of florists and gardeners that watering plants with very cold water is detrimental to growth, but no one has undertaken to state definitely how cold the water may be without producing this result. It is the common opinoon. however, that water applied to greenhouse plants should not be much colder than the air immediately about them. In order to ascertain the facts in the case more definitely the Wisconsin Station instituted a series of tests. The plants were grown under glass, except as otherwise noted.

Twelve cuttings of Coleus, as nearly alike in size and vigor as could be obtained, were divided into four lots and planted in sand. They were watered with water at 35, 50, 65, and 86 degrees F. In twelve days all were rooted equally well. They were potted off and the watering continued. There was no noticeable difference in growth and vigor between the various lots until sixty days after the cuttings were taken, when the 60 degrees lot was slightly the highest. This advantage was only temporary, however, for in a few days the 50 degrees and 65 degree lots slightly exceeded it in height. Ninety days after the cuttings were taken the 35 degree lot was plainly checked, but the other three were practically equal. This test was repeated with water at 32, 40, 70, and 100 degrees. In this case it was difficult to discover any influence due to the temperature of the water used.

Transplanted tomato plants were divided into four lots and watered with water at 35, 50, 65, and 86 degrees. The 65 degrees lot made the best growth throughout the test, which lasted for thirty days. The 35 degrees lot made the slowest growth, but was in no other respect inferior to the others. This test was repeated with water at 32, 60, and 90 degrees. After sixty days the 32 degrees lot was slightly the best. The plants were the tallest, ripened earliest, and the plants and fruit weighed the most. This trial was repeated with plants from seed saved from the fruits of the first crop. Plants from the 32 degrees lot were watered with water at 32 degrees, those from the 60 degrees lot were watered with water at 70 degrees, and those from the 90 degrees with water at 100 degrees.

"In this case the 100 degrees lot yielded the largest amount of fruit and the 32 degrees lot was next in order, while the 70 degrees lot yielded the least; but the difference is so slight that the results may be considered duplicates."

Seed was again saved from this crop, planted, and different lots watered with water at 32, 40, 70, and 100 degrees. Two months from the date of sowing there was no difference between the lots that could be ascribed to the different temperatures of the waters used. "In this case the 32 degrees lot yielded more than the 70 degrees lot, but less than the 100 degrees lot."

A thousand seeds of forcing radish were sown in each of three plots and were watered with water at 32, 45, and 70 degrees respectively. The 32 degrees lot was considerably slower in germinating than the others. In the test the yield of radishes was smallest in average weight in the 32 degrees and largest in the 70 degrees lot, the difference being, however, only 10 to 13 per cent. In a second test, however, there was a noticeable difference. Water at 32 degrees gave decidedly the best results, while 100 degrees gave the poorest.

Beans watered with water at 32, 40, 70, and 100 degrees were equally vigorous. Water at 32 and 40 degrees gave the best results. Lettuce watered with water at 32 degrees yielded slightly more than other lots.

In addition to the above, two trials were made under outdoor conditions. Eighteen half-barrel tubs were sunk in the ground until the tops were level with the surface and filled with soil. All were suitably drained. Nine were watered with ice water; the other nine with hydrant water, which averaged about 75 degrees in temperature. The warm water produced better results than the cold and the difference was much more pronounced in the summer. In the earlier part of the season both lots were equally healthy and vigorous; but later, when the weather had become cooler and the period of most vigorous growth had passed, the plants watered with ice water appeared unhealthy.

Radishes and beans were planted in three plots in the open ground; one plot was watered with ice water, one with hydrant water, and one not watered at all. Those watered with ice water yielded the most and those not watered at all the least, although the rainfall during the season was regarded as nearly or quite sufficient for the development of crops well cared for. The beans showed no difference in yield that could be attributed to the temperature of the water. The yield from the unirrigated plot was in this case also smaller than either of the others.

In a number of these tests a record was made of the temperature of the soil before watering and at intervals for several hours afterwards. The application of ice water of course immediately lowered the temperature of the soil several degrees. It was found that with plants in pots the original temperature generally was not regained for several hours. The application of water of 40 degrees or above, etc., was found to have no effect of importance, the original temperature being soon regained after a rise or fall.

From the results of these and numerous other trials not here noted the conclusion appears fully warrantable that the growth of ordinary field and garden crops is not affected by the temperature of any water ordinarily available for irrigation purposes.

The temperature of the soil about the roots of the plants so quickly regains its original temperature that no check to growth is likely to result.

It is concluded from the result of the out-door work that no harm can result from using for irrigation purposes water from the coldest springs or wells. Water from these sources will not be less than 40 degrees in any case when taken from the well or spring, and by the means ordinarily employed in irrigation would be raised many degrees above this point before reaching the roots of the plants.

It is concluded from the results of the greenhouse work that for vegetable and flowering plants commonly grown under glass, well or spring water may be freely used at any time of the year without warming.

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Citrus Fruit Culture.

In discussing Citrus Fruit Culture, Mr. Prescott, Principal of the School of Horticulture, Burnley, writing in the Victorian Journal of Agricultural, lays stress on the importance of suitability of the soil to be planted. He says :—

"The choice of a suitable soil for oranges and lemons should be the first care of all intending citrus growers. So much depends upon the right soil ; and while these fruits will generally grow for a time at least wherever planted, yet they do not possess the power of adaptability in regard to soils, that other classes of fruit trees have. Two points for citrus soil must be insisted upon ; first, perfect drainage, and second friability of texture.

Whether the drainage be natural or artificial, and natural drainage is always to be preferred, this is the first consideration in selecting the site for a citrus grove. There must be no possibility of any stagnant or sour soil conditions at any time during the life of the tree. Such conditions will inevitably result in the setting in of one or more fungus diseases on the roots. For this purpose, it is preferable that the presence of a clay subsoil should be guarded against, unless the overlying soil is of such a depth that the roots do not penetrate into the clay to any extent. The subsoil should be physically of a naturally porous condition, and only such a subsoil will produce the best results, both of tree and fruit. If the trees are planted where clay subsoils exist, then these must be artificially drained, either by very deep subsoiling or by agricultural drains, or preferably by both.

The second condition, a friable soil, is also an essential one. A soil where the mechanical conditions are suitable, and in which the texture is loose and friable, approaching to a sandy nature, is the suitable soil for citrus trees. The soil may be granitic alluvial, a sandy loam, or, it may even be pure sand ; any light, loamy or sandy soil will carry the best oranges and lemons. Stiff clay soils, heavy basaltic soils, solid loamy soils, and shallow soils are all to be avoided. It is more important to have a friable soil than a rich soil ; it is more profitable to have a free acting soil, than one rich in plant food ; although a fair proportion of vegetable humus is always desirable.

The sand hills on the banks of the Murray and its tributaries, the pine rises and ridges in the Goulburn Valley and in the Mallee, the alluvial valleys on the river banks, and between the ranges, in the North-Eastern district, are all eminently suitable for the cultivation of citrus fruits. Some of the finest oranges ever produced in Victoria were grown on almost pure sand, on one of the sand hills on the Murray banks near Cobram. In one season, oranges of the Washington Navel variety were grown weighing 19 ozs. and 21 ozs. each. In every way they were perfect specimens. While, therefore, a good or even rich soil is not to be despised for citrus culture, a perfect mechanical condition of both soil and subsoil is more to be desired. A poor soil carrying such requirements is better than a rich heavy and undrained one ; and if it be possible to establish the citrus grove in land that does not require subsoiling, the results will be successful and payable.

— Preparation of Soil. —

All tree stumps and roots should be taken out of the citrus site. These are a very fertile factor for the dissemination of several fungus diseases. The soil should then be ploughed, and, if possible, it should be left in a rough condition, so that it may be sweetened by exposure to the atmosphere. It is not advisable to plough too deeply, if the soil be shallow. If the surface soil be of good depth, then it may be turned over to a depth of 8 inches or 9 inches. A subsequent deeper cross ploughing to the depth of 12 inches will be beneficial, as the object of the cultivator should be to get the land worked up into as loose and friable a condition as possible. Thorough preparation for planting is a great aid to future success. Thoroughly friable soil will induce deeper rooting, which is a great necessity in citrus trees.

Orange and lemon trees are far more liable to fungus troubles than are other classes of fruiting trees : hence it is necessary that they should be planted in a thoroughly aerated and sweetened soil, and that these desirable conditions should be permanently maintained.

— Planting and Care of Young Trees. —

When the soil is in a satisfactory condition, the planting may be proceeded with. The season for planting is still a much debated subject. As citrus trees produce their main crops at a time when other trees are dormant, it is to be assumed that reversal of the time of planting is necessary. Therefore, growers have been advised by some to plant in early autumn ; by others, in spring : and, by others, in summer. One point is certain—the soil must be warm for the reception of the young trees ; this is to impel quick rooting.

The young trees must be planted at the same time, relatively, as other varieties of trees are planted ; that is, during their period of dormancy, and shortly previous to the bursting into growth of the new buds. They should be planted just previous to the "spring" season of the trees. The adaptability of citrus trees to alteration of conditions is very great, and they will generally grow whether planted in the spring or in the autumn ; but they should be planted when they will receive the least check. Further, after planting, if planted in their "springtime," they will put forth their young growths of foliage and probably flowers ; and so they should be planted so that these new growths will have time to ripen and harden, before the rigours of winter and the ravages of frost can affect them. Therefore, as soon as the soil is warm in the spring time, planting may be proceeded with. October is generally a good month to do this work. The soil is fairly warm, and the young trees have plenty of time to put forth new roots and thus take hold of the soil before the succeeding winter. If autumn planting be carried out, the soil is warm enough, but the trees do not get sufficient roothold before the cold weather sets in. Citrus trees may be planted at any time from October to March ; but best results will follow from late spring planting.

The trees should not be planted too closely ; the roots travel laterally to a considerable degree, and the roots are also mainly surface feeders. Hence, too much crowding will weaken the trees, and will necessitate heavy manuring in after years. Close planting also prevents, to a great degree, a good circulation of atmosphere, which is a prime requisite, citrus trees being evergreen. A distance of 30 feet each way is quite close enough for all varieties of oranges. They may be planted at distances of 25 ft. or 26 ft., but no closer. Lemons, being of a more compact growth, may be planted from 20 ft. to 25 ft. apart.

The young trees will thrive better if received from the nursery, and planted in a "balled" condition. That is, the tree is removed from the nursery bed with a good ball of soil, and packed in hessian or bagging. The ball is then placed in the holes, which have been prepared for their reception, and the soil is well filled around it, without disturbing any of the roots, and without breaking the ball. The soil is then settled with a good supply of water. There is no necessity to remove the canvas, beyond untying it from round the stem of the tree ; it will soon decay in the soil. It is a help to the young roots when they commence their growth, to sprinkle a handful of bonedust in the hole, before placing the tree in position. If the trees are planted by this method, it will not be necessary to cut away any growth from the tops, unless any one branch is unduly prominent.

A method of planting sometimes followed in California, and known as the "post-hole" method, is to bore holes with post-hole augers some distance into the soil, at the bottom of the ordinary tree holes. These are

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filled with well rotted leaf mould or peaty soil. It is supposed that the roots in seeking their food will grow downwards into these food reservoirs, and that deep rooting will be thereby induced.

Where a few trees only are planted, it is always a help to them, to occasionally sprinkle the foliage lightly with water in the early morning, and also in the evening, until they have a firm hold of the soil. Any weak tree, or one not growing as successfully as the others, may be helped along in this way. A little help and care, when the trees are young, go a long way towards making a strong sturdy citrus grove; especially seeing that as they are evergreen trees, there will be a great amount of weakening transpiration from the foliage every day.

Trees of the citrus family are very susceptible to frost, particularly when young; and, if the grove is planted in regions where frosts are at all frequent, it will be necessary to protect the young trees for two or three seasons in frosty weather, with canvas or bagging. One severe frost will kill a young tree, and it is very necessary to take all precautions to prevent the tree being burned or checked in any way by frosts. Evergreen teees, when planted out in spring or summer, require far more watchful care and attention than do deciduous trees which are planted in the winter. A good watchful oversight of the young plantation, helping on any weaklings by syringing with water in warm weather, hoeing the surface soil, an occasional watering, or pinching back unduly prominent growths, according to the want of the young tree, will repay the operator handsomely, and with good success. The question of inter-crops has now to be considered. It will probably be desired that the land shall be immediately reproductive, the planter not wishing to wait for revenue until the grove comes into bearing. A system of planting other crops between the rows may be judiciously carried out; and while the inter-crop will bring in an immediate result, the work may be done so as to help and improve the plantation. For the first year, the inter-crop may be kept only a few feet away from the young trees, but the distance must be increased as time advances.

The soil must always be kept well stirred; cultivation must be as complete as if there were no inter-crop, and all weeds should be rigorously excluded. The cultivation, as well as the manuring of the inter-crop, will be of great value to the soil. The kind of crop thus grown will be dependent upon the season. All classes of vegetables may be used as inter-crops; tomatoes, onions, potatoes, etc., all do well. Strawberries, gooseberries, and currants are also payable fruits to grow, provided the climate is suitable. Pumpkins, beans, peas, cabbages, cauliflowers, lettuces, and melons may be utilized, if the soil and the markets are satisfactory. A good payable winter crop could be grown from rhubarb. The refuse of these crops will be very valuable as future food for the trees if it be dug into the soil.

— Cultivation and Irrigation. —

Trees of the citrus family are generally shallow rooters or surface feeders; hence, it was urged that, before planting, the soil be well worked and re-worked, so as to assist deep rooting. In cultivating the surface after planting, it will be a matter of urgency that as little damage as possible be done to the root system. Some growers prefer to carry on without any cultivation system at all, merely harrowing the surface lightly, and top-dressing the grove with fresh soil each year. This system will not become universal, as fresh soil is generally most difficult to obtain; still, where possible, it is a most excellent method of renovating and improving citrus soil. Sand dressings are also advantageous; and gutter or creek sand, or any washed sand, will always tend to improve the soil, lightening and opening its texture. Surface cultivation, in the absence of these systems, will always be a necessity; but, whatever method be adopted, the roots must not be cut or mutilated.

Grafting Wax.

A good many old gardeners and some young ones like clay better than grafting wax, but wax has many points to recommend it. The following are good recipes:—

1. Resin, 4 or 5 parts; beeswax, 1 part; tallow, 1 part; linseed soil, 1 to $1\frac{1}{2}$ parts by weight.

2. Resin, 4 lb.; beeswax, 1 lb.; tallow, 1 lb. Melt together and use warm, applying with a brush.

3. Liquid Wax—White resin, 1 lb.; beef tallow, 1 oz. Melt these together, and remove from the fire, then add 8 oz. of methylated spirits. It must be kept in closed bottles or cans and applied with a brush.

4. Resin, 4 parts; beeswax, 2 parts; tallow, 1 part. Melt together and pour into a pail of cold water. Then grease the hands and pull the wax until it is nearly white.

A pound of humus will store seven-and-a-half times as much moisture as a pound of sand; and a pound of sand will lose its water by evaporation three-and-a-half times more rapidly than the humus.

The importance of phosphates cannot be over-estimated. Phosphates improve the size and quality of the grain in oats and wheat, and make the grass in the pastures more nutritive for the animals that feed upon it.

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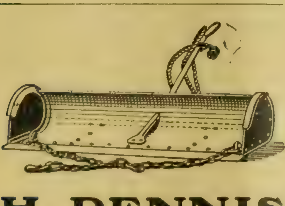
Farm Topics

The following note of the method a northern farmer employed to ascertain whether a cow were in calf or not may be of interest. He used to milk the cow into a bucket, and, having a glass of pure water at hand, dipped a straw into the milk and allowed one single drop to fall into the glass of water. If the milk mingled with the water, rendering it cloudy, the cow was not in calf; but if the drop of milk sank to the bottom before mixing with the water she was pregnant. This test had been used for years, and was never known to mislead. The test was based upon the idea that the milk of a pregnant cow is more viscous than that of a cow which is not in calf, and thus the single drop allowed to fall into the water betrays the condition of the cow by the greater or less tenacity with which it holds together.

Pigs that have no ring in their noses are terrible torments. If kept in the sty they are constantly trying to destroy the floor, and very often succeed in spoiling it completely. If they are at liberty in the fields they will burrow, particularly in the pasture, and make the surface in such a state that one has sometimes to look twice to see whether the field is a ploughed one or a grass one, and this is not only destructive but extremely untidy. It gives the impression that the owner does not care how things go, and that he is not of a progressive disposition. But the cheap and simple process of ringing will stop all this so far as the pigs are concerned, and all pigs ought to be rung just before being weaned, or soon after. It does not affect them in the least, and they eat, drink, and are as merry immediately after as before. It is very much easier to ring them when little pigs than attempting it when they are savage sows or boars. Little bits of sniffling rings are sometimes used, but good strong ones are the best, as they are the best preventive against the most objectionable of their habits of turning the floors and fields upside down. Any handy man on the farm can ring pigs as efficiently as a vet., and a great point is not to omit one.



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Price List.

A mistake often made is to leave the cutting of crops for hay until the grain in them is well-formed. This practice is not in accordance with sound business principles, and should be changed. Hay made from a crop well advanced towards maturity is neither as attractive, as palatable, nor as nutritious as hay made from a crop just after flowering, and in the best markets "grainy" chaff never makes the same money as a bright-green sample containing no grain, for users find it less nutritious and less economical than the bright-green kind, which can only be made from a crop cut before the grain is formed. A crop intended for hay should be cut just after flowering, and whilst the grain is still soft and watery, for at this stage the whole of the nutriment contained in it is evenly distributed throughout the plant, and, seeing that the whole of the plant cut for hay is to be eaten, it is obviously an advantage to have it thus evenly distributed, rather than to have it distributed unevenly, so that one portion of the plant is exceptionally rich, and the other portions exceptionally poor, as is the case when the plant is harvested when well on towards maturity. Once the head is fairly formed, the nutriment contained in the plant becomes concentrated in the grain as it ripens, whilst the stalk becomes more fibrous, less nutritious, and less digestible.

Of late years a great deal more attention has been paid to dental surgery amongst horse practitioners—to the universal benefit of the animals; but there must still exist many thousands of horses which work in pain every day in consequence of troubles connected with their teeth. A correspondent thinks it would not be an exaggeration to say that 20 per cent. of the fractious horses, whose presence in the streets is more or less a danger to the public, are in reality the victims of bad teeth rather than naturally vicious; and certainly a considerable proportion of the animals which go off their feed or lose condition are suffering from a similar cause. Very possibly the fact that the upper jaw of a horse is broader than the lower one causes the upper teeth to wear sharp at the sides, and thereby cause some painful injury to the inside of the cheeks; and a horse must suffer considerably if he has a bad hollow tooth when a cold bit is put in his mouth. It is most desirable, therefore, that the teeth of all horses should be subjected to a periodical inspection, and if this practice is enforced the results will often astonish the owner who has not thought the matter out. Any inattention to such details is likely to be the cause of a horse contracting bad habits, such as disinclination to take hold of his bit, or running back at the start. Such tricks are liable to become confirmed if a remedy is not forthcoming in time, and hence the necessity for a periodical inspection of the mouth.

Upon the use of potatoes for calf-feeding, mixed with separated milk, a New Zealand farmer writes:—"As potatoes contain about 78 per cent. of water, 1 per cent. of mineral matters or salt, 2 per cent. of protein, and about 18 per cent. of carbohydrates; and skim milk is particularly a flesh-forming food, while potatoes are almost exclusively fattening or heating, the two combined form a fairly well-balanced food. The method we adopt is to boil and mash the potatoes, then mix thoroughly with the milk before pouring it out for the calves. The milk should be perfectly fresh, and in winter-time should be fed warm. About 1½ lb. to 2 lb. of potatoes should supply a large enough percentage of carbohydrates to each gallon of skim milk; but when the calf gets used to the mixture 3 lb. of potatoes per gallon could be used. It is difficult for some farmers to secure grain-meal and other calf-feeds, but no farmer need be without potatoes, and by this means he can supply the calf with the fat-forming properties taken away from his milk by the butter-factory, and save many an animal that would otherwise succumb to scours or other diseases due to lack of proper food."

How many people neglect proper care of the separator. It should be remembered that in order to have the perfect motion of the separator bowl, the machine must be set level and be kept clean and well-oiled. The oil should be thin or light so it will not gum the wearing-parts. A heavy oil will make the machine run hard, and will gum quickly on small high-speed bearings. All the bearings of the machine should be frequently flushed with coal-oil. It is well to make a run about once in two or three weeks, using coal-oil on all the bearings. This keeps the parts free from gum, and washes out grit or sand that may have blown into them. It is an excellent plan to have a cover of close-woven cloth or oilcloth which can be kept over the machine while it is not in operation. This will keep out dust and will add materially to the lasting powers of the machine. The separator should be set upon a good solid floor, so that it will not move about as the operator turns the crank.

On the subject of horses' sore shoulders a correspondent recently wrote to a Victorian paper:—"'An ounce of prevention is worth a pound of cure' is an old saying that we all know. While I do not say that you can cure sore shoulders, I will say that you can prevent them. If you will take the trouble to wash your horse's shoulders with pure water morning, noon, and night, you will find that you will not have a sore-shouldered horse on the farm. Do it for the first week or ten days after you commence hard work. Do not use sweat-pads, as they do more harm than good. I think that it pays to take the harness off at noon. The horses can rest that much better after a hard half-day's work. Some think it too much work to clean off their horses. I clean mine off once a day, and from the difference in the looks of a team that has been cleaned off and the one that has not, I think it pays to give them a good brushing every day. I have heard it said, 'What difference do the looks make?' but I believe that if you will clean your horses every day they will work quicker and better, and will pay for the time it took to brush them off.'

Some difficulty is occasionally experienced in teaching a calf to drink, and the following American method may be of interest, though probably not quite convincing:—Fix things so that the calf can never suck its dam, and when the cow has mothered it for a few hours, milk about three quarts of her milk into a pail, put it up under the calf's nose so as to touch it, and in a minute it will drink from the word "Go," and you have won out, and kept your piety besides. A calf that has never sucked will drink as readily as it will get the hang of finding its own dinner. By the same rule a heifer should always be hand-milked, and then she knows no other way. Let the calf run with her a few days, and then to milk her is, in her way of thinking, "robbery" of her calf, and you have to break her, which often is quite a vaudeville show, and may be somewhat unpleasant memory. From the start, play that you are the heifer's calf, and make her believe it, and to the calf be its god of the feed dish, and two disagreeable things in dairying—breaking heifers and teaching calves to drink—are made into pleasant pastimes.

The question is frequently asked, "Is the milk secured at one milking present in the udder in the form of milk at the time the milking begins?" In answering such an inquiry at a dairyman's meeting a Canadian farmer said: The udder contains a great deal more blood than it does milk. You take a large udder of a cow, of course it looks very much as if there was a very large quantity of milk in that udder, but if a cow happened to be shot or killed instantly, and you took and opened her, you would find very little milk. Perhaps some of you have sat down to milk a cow, and you would get a little milk at the commencement quite easily, and then you have said the cow failed to let down her milk. When you have milked out that milk that came easily, you practically had taken all the milk that was in the udder, and then it was not until you continued your manipulation some time that she began to let her milk down again, and that was the time she commenced to secrete the milk. There was not a great deal of milk in the udder at the beginning.

To ensure the boar keeping in good service condition he should have plenty of exercise. To permit this a good roomy pen or large yard must be provided. In summer he should have at least a small pasture wherein to roam and root at will. Not infrequently returns of sows to service are due to lethargic condition of the boar rather than to sterility of the sows. Plenty of exercise, with the right kind of food, will almost entirely overcome this condition. The boar should be fed sufficient food to keep him growing rapidly, and in good flesh in any case. He should not, however, be fed such foods as are likely to make him fat, but rather flesh- and bone-forming foods.

One thing ought always to be considered when men start out to buy pure-bred cattle (says a writer in "Hoard's Dairyman) — that is, that the knowledge, skill, and character of the breeder are about as important as is the animal they are to buy. There is a wonderful difference between being a real breeder and one who simply mates male and female. The philosophy of breeding is a very deep question. One man's cattle show almost always a progressive quality. They are the product of skilful, intelligent mating. Another man gives no thought to the deeper phases of the question. He simply breeds pure-bred cattle together; there is no intelligent adaptation of means to ends. The average capacity of his cattle shows a hit-and-miss result that is very confusing and disappointing. It is right to say that there will be fully enough failures even with the most thoughtful and comprehensive breeders. What must it be with men who bestow but little thought or study upon the deeper physiological problems that are involved, and which will have their way? Take, for instance, this matter of keeping two or more bulls in a breeding herd. The question of a successful "nick" is an all-important one. Yet in almost every herd of cows there will be found a certain number which do not nick well with the head of the herd. An observant breeder will note this. Mate them with another sire, and with the most of them at least the result will show a decided improvement in the strength and vigour of the offspring.

Too little attention has been paid by breeders and farmers to the milking qualities of their brood sows, and yet, of all things to be taken into consideration in selecting brood sows, this characteristic is the most important. Maternity is the function of a good sow, and, failing in good milking capacity, she fails to fulfil this function. Did you ever note that the sow that is the kindest, most careful mother, is always the one that gives the biggest flow of milk, and the sow that gives most frequently, and most gladly responds to the call of the little fellows for a lunch as often as they want it. She is careful and grateful to them for the relief they give her. The other sow finds no such comfort from her litter, since she has no need for that kind of relief; on the contrary, the frequent demands of the half-starved pigs are unpleasant to her. She becomes irritable and cross at their persistent calls for more. She would rather be left alone, go off by herself, eat her fill, and lie down undisturbed, while she converts it into pork on her own back instead of her pigs. Consequently, at weaning-time, you will find her in pretty good shape, while the pigs are all runts. But the other sow and her litter. How do they look? Just the reverse.

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Picking Out a Cow.

Some men have a knack of doing this that puts everyone else to shame. They will go into a herd, and as soon as they look the stock over say: "There is a good cow." Acting on this suggestion one finds he has not made a mistake. How the thing was done is as much a mystery to us afterward as now. We only know this man's judgment has not failed us. But few men are able to make such a choice. Most of us, as the old saying is, "don't know a good thing when we see it" in the line of a cow. But there are certain homely signs which are helpful to the man who sets out to find a cow for his dairy. Some of these are as follows:—The cow ought to be of fairly good size, so that she can eat a good ration. She should have a large udder and good-sized teats. Following the milk-vein along to the entrance to the body, in a good cow we would expect to find a hole large enough to take the second finger readily. Some hold that the vein itself should be large and crooked. The cow should have a thin neck and a slender tail. She should be wide between the hind legs. She should have a good, honest look in the eyes. She should stand handling well. When milked she should enjoy the process if the milker be a good hand at it. A couple of rudimentary teats behind the four fully-developed ones are a good indication. If added to this we know the owner of the cow to be an honest man, and he tells us that the cow is a good one, if we can agree on the price we may be reasonably sure that we have gotten the worth of our money. This matter of picking out a good cow has proven so unsatisfactory to a great many men that they have come to the conclusion that they can better afford to raise their own cows from calfhood than to trust their judgment to select them from other herds. There is a satisfaction about this that goes a long way. If the heifer should fail to turn out well we cannot blame any one but ourselves; whereas, if we trust the man we buy of, and then our expectations are not realized, we are quite inclined to find fault, and never fully trust the neighbour as we did before. It really is more of a job to pick out a good farmer than a good cow. So many men think when they sell a cow that she is the very best of all in the lot, when the fact is they are, for the time being, sadly mistaken. Self-interest is so strong. After we have done our best we may be deceived. If we are, the best way is to get out of it as well as we can, blaming no one, and try to do better next time.—Farm and Fireside.

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Controlling the Sex of Calves.

A young and vigorous bull, as a rule, gets more bull calves than an old one, says "Scio," in the "Live Stock Journal." Last year I had on service a yearling bull, and also a five-year-old bull. I do not pretend that one herd can give one any real criterion, still less 13 cows; but during the last three months I have had six calves from the old bull, which were four heifers to two bulls, and five calves from the young bull, which were four bulls to one heifer. Some cows have a decided tendency to breed bulls. One cow out of mine out of eight or nine calves has only once thrown a heifer. In a case like this the decided tendency on the part of the cow entirely eclipses any tendency on the part of the bull in the opposite direction. A strong, big-framed, beefy, vigorous cow, with a small milk yield, should have a tendency to breed bulls, while a heavy-milking cow, whose frame is more or less exhausted by a big milk yield, especially if she is served again pretty soon after calving, should have a tendency to breed heifers. I do not mean to say that the 'tendency' implies that every calf will be a heifer, but that the majority of the calves will be heifers. I think that the best way to get heifer calves is to have an old slow bull, the slower the better, with plenty of work to do; whereas if bulls are wanted, young quick bulls should be kept, and care should be taken not to overwork them."

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When to Give a Horse a Drink.

The proper time to give a horse a drink is before feeding, because if the animal is allowed to drink much water immediately after consuming a full feed of grain, a portion of the undigested food is liable to get washed into the intestines, and there set up an irritation and inflammation, which very frequently leads to serious digestive disorder. Watering animals after feeding is one of the most fruitful causes of colic.

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South Australian implement makers have been experiencing a busy time of late, and none more so than Mr. H. Dennis, well-known as the manufacturer of the popular Steel Buckscraper and Silt Scoops, and other useful implements. Mr. Dennis has already had ample proof of the wisdom of moving his factory from Morgan to the city, as since doing so his output has very greatly increased, due no doubt to the fact that Adelaide makes a far better distributing centre than the river town. The premises in Franklin and Waymouth Streets are fitted with the latest and most up-to-date plant and labor saving appliances, and though a constant stream of orders is flowing in, the enterprising proprietor finds no difficulty in dealing with them. Farmers who do not already possess a copy of Mr. Dennis' latest illustrated catalogue should send for one, for it will be found to contain much of interest to the man on the land.

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Horses' Teeth.

The teeth of a horse perform two important duties they form the instruments by which the animals bite, break, grind, and masticate their food, and provide reliable data from which their age can be determined.

Like all other animals, the horse has two sets of teeth during its life—namely, a temporary set and a permanent set—the former being called the milk or deciduous teeth, which are shed at intervals to make room for the permanent set, or teeth of the second dentition. The mouth of a full-grown horse contains forty teeth, all of the second dentition, twenty-eight of these having replaced at intervals the milk or temporary teeth.

The full set of teeth are divided into three classes the incisor teeth, frequently called nippers or cutting teeth; the molars or grinding teeth; and the canine teeth, sometimes termed tushes, or tusks.

The incisor teeth, situated towards the front of the horse's mouth, are twelve in number, six in each jaw. They fit accurately together when the animal's mouth is closed, for the purpose of nipping and cutting grass and herbage, and it is principally and usually from these teeth that the age of a horse can be ascertained.

The incisor teeth are divided into three pairs in each jaw, each pair of temporary teeth being shed and replaced by the permanent teeth, approximately, at the same time.

The canine teeth, four in number, one in each side of each jaw, a short distance behind the incisor teeth, are small pointed teeth found only in the mouth of entires and geldings, except in very rare instances, when they may be seen in a very rudimentary form in a mare's mouth. Canine teeth are of a permanent character, and usually make their appearance when the animal is between the age of 4 and 4½ years, and the only evident purpose they serve is to afford some slight information with regard to the age of a horse, as at first they are very pointed, but after about a year become blunt, the bluntness increasing with age.

The molars, twenty-four in number (six in each side of each jaw), are for the purpose of grinding and crushing the food. The milk teeth of a horse are twenty-eight in number, consisting of six incisors in each jaw, and eight molars in each jaw. The temporary teeth differ considerably in appearance from the permanent teeth, and can readily be distinguished, the former being small in size and perfectly white, whilst the latter are large, and of a dirty yellowish colour.

At birth, or soon after, the foal has the central temporary incisor teeth, and by the time the animal is nine months old both the laterals and corners will have made their appearance, so that a yearling has a complete set of milk incisors. A point to be borne in mind is that foals are usually born in the spring, and in determining the age of a horse each year will of course be completed in the spring. The terms "rising four," "four off," "rising five," "five off," and so on, mean that the animal is respectively a few months younger or a few months older than the year mentioned.

The shedding of the incisor teeth in individual horses, of course, varies a few months, according as to whether the animal is in a forward or backward condition, but, generally speaking, the central incisor teeth are dropped at two and a quarter years old, and at five years old a horse's mouth is almost perfect, as the whole of the milk teeth have been shed, and the permanent teeth become fully developed, and when this occurs the animal is said to be full-mouthed.

A horse's mouth can be easily opened for the purpose of examination by placing the finger in the side of the mouth in the space between the molars and the canine. This will cause him to open and move his mouth with the object of removing the finger, and in so doing will show sufficient of the lower jaw to enable any one to ascertain the particulars necessary to determine his age.

The diseases of the teeth of a horse are but few, and it is not very often that a hollow tooth is seen. The grinders occasionally grow irregularly in length, and interfere with the grinding motion of the jaw, and in such cases the projecting pieces should be removed, and the tooth made level with the remainder. Colts should be carefully watched between the shedding of temporary centrals and the growth of permanent centrals, as, having a broken mouth, grazing may prove rather a difficult matter, and if the animal loses condition, feeding with bran mashes, crushed corn, and suchlike foods, will be necessary. The following table will be found useful to those interested in horses, as it shows at a glance the condition of the incisor teeth at certain ages.

At two years old the centrals are temporary, laterals temporary, and corners temporary.

At three years old the centrals are permanent, laterals temporary, and corners temporary.

At four years old the centrals are permanent, laterals permanent, and corners temporary.

At five years old the centrals are permanent, laterals permanent, and corners permanent.

At six years old the mark on centrals is disappearing, on laterals perfect, and on corners perfect.

At eight years old the mark on centrals has disappeared, on laterals disappeared, and on corners disappearing.

At nine years old the mark on centrals has disappeared, on laterals disappeared, and on corners disappeared.

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A vicious sow is more likely to destroy her own pigs than one with a gentle disposition, and this is a very important matter to consider. While it is true a hog is simply a flesh-producing machine, yet the nervous condition is as much to be considered as any other point.

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Care of Horses' Feet.

It is scarcely a matter for wonder that so many horses go wrong in their feet, when the results of careless or incompetent shoeing and the amount of usage the hoofs experience are considered. Even horses which are driven slowly are subjected to almost as much risk from the effects of wear and tear as is the animal which moves faster; for, though the latter, and especially if he happens to be a higher mover, places his feet down harder than the other, the slow mover puts them down considerably oftener. It has been calculated that a horse working at a slow place will move his feet up and down over eleven million times in the course of a hard day, and about eight million times during a moderately hard one, whereas an animal worked at a trot puts down his feet some seven million times if he has a day out, and about half as many times in the course of a moderately hard one. Assuming that these figures are worthy to be accepted—they are the work of an eminent veterinary authority—an idea will be derived from them of the risks of concussion to which horses are liable, with the possible result that some owners will devote more attention to the treatment of their animal's feet, especially if they work on hard ground. Unfortunately, however, many people are disposed to wait until trouble arises without adopting proper precautions for ensuring the proper preservation of the hoofs. It may be that the farrier is allowed to try on red-hot shoes or to rasp the outside walls of the hoof. The drawing-knife may be directed against soles, and little or no pains taken to insure a shoe of a proper design being fitted to the horse. Now and then, too, a horse is worked after it is known that his feet are beginning to require treatment, and then serious lameness may result, whereas a few days' rest and careful treatment would have put matters right. Such diseases, for instance, as thrush, which often does not cause lameness until it assumes a virulent form, will usually yield promptly to treatment, and yet many cases occur of their presence being ignored on the grounds that the horse is not lame, and, therefore, it is unnecessary to attend to the feet.—"Farmer's Advocate."

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Shoeing the Horse.

— Prize Essay in American Blacksmith. —

The growth of a horse's hoof is like a finger nail, and unless it is worn off at the bottom or bearing surface it becomes too long. If worn off too much, the sensitive portions of the foot do not have sufficient protection, and the horse goes lame. In a natural state, however, the horse's hoof keeps itself perfectly proportioned. If the ground is hard the horny portion is worn away as fast as it grows. All shod hoofs become overgrown in from four to five weeks. In such cases there appears to be an excess of horn at the toe, and since the horny fibres do not grow straight down, but obliquely forward, the general surface of the foot is carried forward. This throws it out of proper relation with the rest of the foot and injuriously affects every part of the foot; in fact, the entire leg may bear directly upon it.

On an average the wall will grow an inch in three months. The more actively a horse is exercised the faster the hoof grows, and inflammation checks growth. If there is no bearing on a certain part it will grow quickly and become even with portions that receive the bearing. If the hoof be broken or rasped away to relieve pressure, in a month's time that part will be found in all probability flush with the shoe. The sole grows in the same manner as the wall, but it wears away quite differently. It never becomes overgrown, like the wall, for it becomes flaky, dry, and brittle, then breaks and falls out. When the frog comes in contact with the ground it wears off in shreds. The horn of the frog is softer than that of the wall or sole and stands wear as well as either of them. As it is elastic and rests upon a still more elastic cushion, it yields and leaves the wall and sole to bear the strain.

The growth of the frog depends largely upon the condition of the bars. If these are overgrown the frog receives no bearing and wastes away. High heels are always accompanied by a small frog, and low heels have a large frog. Horn is porous and absorbs water readily. If too much water is absorbed the horn is, of course, weakened. The natural protection to this is the varnish-like outer wall, and when this is removed by rasping, moisture is more easily absorbed, until the horn beneath becomes hard and brittle from exposure and friction, as we have already said. Horn is a poor conductor of heat; therefore, if the horn is thick, fitting a hot shoe for reasonably short times does no harm, but it is not well to follow this practice. It is very important in shoeing a horse that the bearing surface of the foot on which the shoe is placed be perfectly even, and that the horn be of equal height on both sides. If one side is trimmed off more than the other, the side of the wall left too long will, in time, become bent, and a crooked hoof results, in which the rings are placed nearer together on the low or concave side than on the high and convex side. The toe, also, if left too long, will, in time, become bent, and heels which are left too long will in two or three months contract just under the coronary band or curl inward at the lower borders.

Wear on the hoof is affected by the position of the legs. As there are badly-formed bodies so also are there badly-formed hoofs. The form of the hoof depends largely

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upon the condition of the limb. A straight limb has, as a rule, a well-balanced, regular hoof, while a crooked limb has a hoof to match.

A plumb line dropped from the middle of the shoulder blade divides the foreleg into equal parts above the fetlock, and touches the ground just back of the heels. The line formed by the three phalanges of the foot should form an angle of 45 to 50 degrees with the ground.

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Rugging Horses.

"Tom" writes: Those who have charge of carriage horses (in fact of any horses) should exercise great care in rugging them. In putting the rugs on take care to pull the rug back from the shoulder to get it in place not forward. If the latter is done the hair is raised by pulling it forward and the coat becomes uneven. In taking rugs off, undo the breast strap first and then the straps from the flank and pull the rug from shoulders over the hips. Always let the rug when not in use, hang up, inside out, as there is a certain amount of sweat on the lining, which, if the rugs hang folded inwards cannot be dried and sweetened by the air; this substance becomes gummy and sticks to the horse's coat when the rug is next used.

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Spontaneous Combustion of Hay.

Fires which are reported to be caused by the spontaneous combustion of hay are by no means rare. While some of them are doubtless of an incendiary origin, others are really due to the cause assigned.

It is well known that when moist hay is stored under favorable conditions fermentation takes place, which may produce a considerable amount of heat. Under suitable conditions some of the organic matter of the hay is oxidized by the oxygen of the air. Carbon dioxid and water are produced. The water moistens the hay and the moistened material ferments. Fermentation produces carbon dioxid, water, and small amounts of other compounds. Heat also is produced. The fermentation is more active if the material is moistened at the beginning. However, the water produced by the oxidation of the materials is sufficient to start it. This fermentation produces a temperature of about 132.8 degrees F. At this temperature a second and more violent oxidation takes place and the temperature rises to about 190 degrees F. Other processes then take place which char the material and cause a slow rise of temperature to 266 degrees F. When this temperature is reached, the hay chars rapidly. All these processes destroy at least half of the material present. Theoretically, the temperature may rise to 374 degrees F.

Spontaneous combustion is indicated by the hay becoming darker in color until it is finally black, by a sooty odor, and by smoke irritating to the eyes. The ash of the burned hay has a characteristic grayish white appearance and feels like sand. The burned hay is surrounded by a layer of charred but not burned material, which is a poor conductor of heat.

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The Tillering of Grain.

Grains tiller or stool when they throw up shoots from the root after the seed has sprouted and the main stem has made its appearance. A stool of grain thus consists of the stems and shoots produced from a seed, and may be considered a single plant. This method of growth is characteristic of the grasses to which all cereal crops belong. The number of shoots which grow and develop into grain-bearing stems depends mainly upon the fertility of the soil, the influence of weather conditions, and the distance between plants. Worn-out soils, or soils in which the plant food is not readily available; cold weather, either too wet or too dry, and sowing the grain too thickly, are conditions which are detrimental to tillering.

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Influence of the Height of Wheel on the Draft of Farm Wagons.

This is a subject regarding which there is considerable difference of opinion. The Missouri (U.S.A.) Experiment Station has put the matter to practical test in a series of trials made on macadam, gravel, and dirt roads in all conditions, and on meadows, pastures, cultivated fields, stubble land, etc. With a net load of 2,000 pounds in all cases, three sets of wheels were tested, as follows: "Standard—front wheels, 44 inches; rear wheels, 55 inches. Medium—front wheels, 36 inches; rear wheels, 40 inches. Low—front wheels, 24 inches; rear wheels, 28 inches." The results obtained and conclusions reached were, in brief, as follows:

For the same load, wagons with wheels of standard height drew lighter than those with lower wheels. The difference in favor of the standard wheels was greater on road surfaces in bad condition than on good road surfaces. Low wheels cut deeper ruts than those of standard height. The vibration of the tongue is greater in wagons with low wheels. For most purposes wagons with low wheels are more convenient than those of standard height. Wagons with broad tires and wheels of standard height are cumbersome and require much room in turning. Diminishing the height of wheel to from 30 to 36 inches in front and 40 to 44 inches in the rear did not increase the draft in as great proportion as it increased the convenience of loading and unloading the ordinary farm freight. Diminishing the height of wheels below 30 inches front and 40 inches rear increased the draft in greater proportion than it gained in convenience. On good roads, increasing the length of rear axle, so that the front and rear wheels will run in different tracks to avoid cutting ruts, did not increase the draft. On sod, cultivated ground, and bad roads wagons with the rear axle longer than the front one drew heavier than one having both axles of the same length. Wagons with the rear axle longer than the front one require wider gateways and more careful drivers, and are, on the whole, very inconvenient and not to be recommended for farm use. The best form of farm wagon is one with axles of equal length, broad tires, and wheels 30 to 36 inches high in front and 40 to 44 inches behind.

◆

It is better to try kindness on the kicking cow than to beat her. If that does not work, the best remedy is to send her to the butcher.

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The Breeding Sow and Her Treatment.

Much might be written on the treatment and management of breeding sows. In many ways improved methods might be adopted with financial advantage to those connected with the pig-breeding business.

Young sows intended for store are usually turned out without any special arrangements being made for supplies of suitable food being provided. They have to shift for themselves. Their condition is taken into account only when they seem large enough to be put to the boar. This treatment accounts for the numerous losses that result afterwards in breeding.

Young sows are better kept in growing condition with regular diet from the time they are weaned. The foods given should be such as produce flesh and bone without stimulating or leading to rapid growth and development. If this course is adopted, the young sows will have well-formed bodies, be strong and active, and quite capable of producing healthy progeny. These sows become domesticated, tame, and easily handled in times of sickness.

When gestation is going on, the same judicious feeding is necessary. Sties are specially fitted up for farrowing, suitable chopped straw being provided with which the sow may instinctively prepare her bed. Many a good breeder becomes restless, nervous, and upset when farrowing comes on, by being put into a strange sty with unfamiliar surroundings. This may entail serious loss.

After the birth of the litter, all have to be kept quiet and visited only occasionally. Warm mashes are then indispensable in order to stimulate milk supply.

Young pigs should not be handled unless in very extreme or necessitous circumstances. Farrowing is a natural operation, and no risk should be entailed, provided the sow has been naturally treated beforehand.

Drugs to pigs tend to upset the digestive system, make the animals wild, and most frequently do little real good.

Much has been written recently on cooked food for pigs. Experiments at various stations go to show many contradictory results. So far as can be made out from statistics and practical tests, it would seem that cooking does not increase the feeding-value of meals. The weight of evidence favours the theory that cooking decreases the digestibility of meal.

Potatoes, however, appear to be improved by cooking, but their feeding-value varies thereby. With turnips, again, cooking is an advantage. On the whole, cooking apparently tends to make foods palatable in some cases, but its effect on the digestibility of foods appears injurious rather than beneficial. Potatoes are an exception to the general rule, and appear to be more digestible as well as more palatable when cooked.—S. W., in Live Stock Journal.

◆

Food, water, air, light, and exercise are necessary to maintain all our domesticated animals in health and usefulness.

Bacon as a Food and a Luxury.

The following simple system of old-fashioned curing, whilst entailing a modicum of work, will give you hams and bacon "fit to set before a king" (says the Mark Express). The quantities following are for a pig weighing 200lb., and can be added to or curtailed in the case of heavier or lighter carcasses. First see that the butcher, in cutting up the pig, has extracted all the blood veins. If not, draw them out. Rub over the several pieces—hams, shoulders, and flitches—7 lb. salt, and place them in a deep tub, or one half each in two tubs, if available, as the pieces are the more easily handled. Allow them to remain so for two days, then take them out, throw away the brine that has been made, and wash out the tubs. Mix together 4 lb. fine salt, ½ lb. saltpetre (also crushed fine), and 2 lb. coarse brown sugar. With this rub over each piece, and place them in the tubs sward downwards. If any of the mixture remains sprinkle it over the bacon. Allow them to remain until the next alternate day, when brine will have formed in the bottoms of the tubs. Rub the pieces over with this brine, holding them in the tub, on each alternate day, and, in putting them back, reverse the positions in the tubs, so that each in turn gets the benefit of the brine at the bottom.

Take out the flitches at the end of ten days (not counting the first two days when in salt alone), shoulders at the end of fourteen days, and hams at the end of twenty-one days. When removed finally, wipe over with a cloth wrung out of tepid water, and sprinkle over a little dry oatmeal; dust the bone openings of shoulders and hams with cayenne pepper to keep out flies, and hang from the ceiling of a moderately warm kitchen to dry. If they are seen to sweat, they are too near the fire. For keeping, a dark room is best, as flies will not enter. Some persons tie up the hams in fly-proof canvas or linen bags. Legs of mutton, cured in the same way, afford delicious eating. By the above process you will not have undue salt in the bacon.

◆

Ordinary poultices can be made with anything that will retain heat and moisture, such as linseed meal, bran, boiled mashed turnips, soaked bread, etc.

BETTER CROPS

TRADE MARK

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"TOP BRAND" FERTITIZERS.

They are now being used extensively all over the State with very great success. If you want increased yields, and bigger profits, write us and we will tell you the exact kind of manure that you need for your particular produce.

ADELAIDE CHEMICAL & FERTILIZER CO., LTD.,
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The Beauty and Value of Tree-Planting.

Of all the materials at our disposal for beautifying and enhancing the value of our properties, and the country in general, none are so indispensable and so easily managed as trees and plantations. And yet this is a subject which has received but very little attention in this country. There are a few enterprising individuals who have taken the matter up; but this is not sufficient. What is really wanted is some good workable scheme for the afforesting of the whole country; and as tree planting is bound to be an essential branch of farming—indeed, perhaps, the most important and necessary one—I am encouraged to offer a few remarks on this all important subject, with the hope that it will attract the attention of those who are in a position to cause the same. I have occasionally been asked, "What are trees for?" I always reply, by asking another question, "What are trees not good for?"

I have yet to meet the individual who does not love and admire them. A man may be as ignorant as a doormat, and utterly indifferent to anything and everything around him, but he cannot pass a fine lot of trees without passing some remarks on their appearance. Who is not grateful for their welcome shade from the noonday sun? Why, even the very beasts of the fields appreciate them.

Let anyone who has lived for years in a well-wooded country, with leafy dales and forest clad hills, and nature smiling all around; let such, I say, be placed in a vast plain, with nothing to meet the eye but the same dreary barrenness all around, where the sun strikes down with parching heat, or the winds sweep with unbroken fury, no shade whatever; and they will estimate by contrast the beauty and value of tree-planting.

There is no employment or recreation which affords the mind greater or more permanent satisfaction than the cultivating of the soil and adorning our own properties; and in tree-planting it is marvellous what a peculiar fascination it has on anyone who has planted even on a small scale. As the years come round and he sees his small trees developing and towering upwards, forming a landmark on the plain, he is really not satisfied, and reasons with himself thus: "Those few trees are a grand success; finest things I have on the place, and how the cattle like to get under them!" This last thought gives him a grand idea; he decides to plant more, even if only for shelter belts for cattle. He feels he must go on adding to the beauty around his home and derives a keen pleasure from same; for is he not engaged in the grandest work imaginable, turning a barren and dreary country into a land of valuable forests, making a grand asset for himself and children; and to the country at large such work is of immense value.

Again, forests of trees are well known to be a great factor in connection with the rainfall. The more densely a country is wooded the larger the rainfall. Consequently, this fact alone should appeal to and influence everyone, for if we can improve our rainfall we can produce heavier and better crops, so that the cost of living would be cheaper.

If it were necessary to offer any other inducement to the landowners to plant trees, apart from their great beauty and value, he would find definite pleasure and satisfaction from their cultivation. —P.B. Agricultural Journal.

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TEFF GRASS. A valuable grass for dairymen, horse breeders and farmers, good for dry country; sold largely for forage in South Africa, commanding good prices. Trial packets only, 1/- packet.

PHALARIS COMMUTATA, PASPALUM, BOYD'S CLOVER, MELILIOT, SUBTERRANEAN CLOVER, IRISH RYE GRASS, CHOU MOELLIER, and all reliable Farm Seeds.

FLOWER SEEDS, VEGETABLE SEEDS AND BULBS. All Garden requisites.

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Three Mistakes in Pig Raising.

There are three mistakes frequently made in pig-raising.

It is a mistake to forget that the pig is a grazing animal.

It is a mistake to feed pigs of all sizes together, wherever the smaller ones are at a disadvantage.

It is a mistake not to grow pigs rapidly from birth to market. They should gain every pound possible on the way.

Disinfection and Commercial Disinfectants.

(Contined from June issue).

Chloride of Lime is widely sold for deodorizing and disinfecting purposes. Its correct name is chlorinated lime. When freshly prepared or carefully preserved in air tight packages, it is a very useful agent. It may be employed as the powder or in solution. Six ounces of the powder to one gallon of water may be used to disinfect discharges and for scrubbing floors and woodwork. Chlorinated lime is used in much the same way as lime. It is more powerful but for general use does not seem to have any advantages over lime.

Formaldehyde Gas is one of the newer germicides and is perhaps the most useful disinfectant for general purposes known. It is irritating to the eyes and throat, but is practically non-poisonous. It can be used freely in the finest rooms as it is non-corrosive and does not injure pictures, clothing or even the most delicate fabrics. It is also a true deodorizer, uniting with the products of decomposition to form new compounds which are free from odor and sterile. Formaldehyde may be obtained under two forms, formalin and paraform. Formalin is a solution of the gas in water and should be 40 per cent. strong. In very cold weather, commercial formalin is apt to lose strength owing to the action of cold, which causes the gas to become solid, and be precipitated as paraform. This is known as polymerization of the gas. Paraform is a white substance with a greasy feeling. By heating it can be again driven off as gas, and is much used for disinfection. All preparations of formaldehyde gas will cause the outer layer of the skin to peel after some days, though at the time of application no redness or irritation is noticed. In using it, therefore, it is well to avoid getting it on the hands or any part of the body.

The commercial formalin may be used in a number of ways. A solution of one part formalin to four parts of water forms an excellent wash for walls, floors, and woodwork; and for soaking infected clothing,

— Spraying. —

An excellent method for disinfecting a room consists in suspending a number of sheets on cords stretched from wall to wall and spraying these with undiluted formalin. Not less than ten ounces of formalin must be used for each 1,000 cubic feet of space. A sheet will take about five ounces of formalin without dripping.

In employing this simple method some precautions must be observed. The room must be tightly sealed by pasting heavy paper strips over all cracks, and kept closed for twenty-four hours. The formalin must be sprayed on in fine drops which do not wet the sheet nor run together. Fairly good results can be obtained by dipping an ordinary whisk broom in formalin, and splashing the sheet by swinging the brush. The spraying must be rapidly done. This method is almost useless in a cold room, as the formaldehyde polymerizes. It should be employed only in warm weather or in a heated house.

— Retort Methods. —

Formaldehyde is often driven off from formalin by heating in a retort or "re-generator." The gas is carried into the room through the key hole or some similar opening by a rubber hose. The rooms must be carefully sealed with paper strips. This method is efficient but tedious and requires rather expensive apparatus. While it has many uses it has been superseded to a great extent by what is known as the formalin-permanganate method.

— Formalin-Permanganate. —

When permanganate of potash is mixed with formalin a violent reaction takes place and formaldehyde gas is liberated rapidly, almost the total amount of available gas being given off within a few minutes. It has been shown by experiment that a large quantity of gas with short exposure is more efficient than a small quantity with long exposure. For simplicity and efficiency this method is superior to all others.

In applying it all we have to do is to place the proper amount of permanganate in a suitable vessel and pour the formalin over it. Ordinarily ten ounces of formalin must be used for each 1,000 cubic feet of space. For every ounce of the formalin, one-half ounce of permanganate must be used. For instance, if our room contains 1,000 cubic feet of space, we use ten ounces of formalin and five of permanganate. On account of the frothing which occurs, a deep vessel should be used, and not more than a pint of formalin be used in a single vessel. The ordinary galvanized iron or tin bucket may be used conveniently, employing several if the room is large. The gas begins to come off almost immediately, forcing the operator to leave the room at once. On account of the heat generated, it is well to place the buckets in shallow pans containing water. The gas occasionally takes fire, hence there is some danger in this method. The buckets must therefore not be placed near curtains or any inflammable material, and must be watched for a few minutes. If fire does not appear within the first few minutes the room can be closed with safety.

Paraform is sold in tablets, or in cakes, and is used by heating. It first melts, then goes off as

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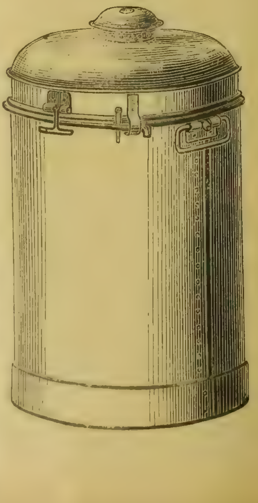

rmaldehyde gas. It catches fire ther easily, burning with a blue ame. It has no disinfecting ower when burned. This method n be recommended only for nall rooms, closets, etc. It is heap and easily handled. All acks must be carefully sealed and e room or closet kept shut venty-four hours. At least two mces of paraform must be used r each 1,000 cubic feet of space.

— Sulphur. —

The burning of sulphur is one of e oldest methods of disinfection nown, but has been almost entirely displaced by newer and more liable methods. It kills only on e surface and does not destroy pores. It is very destructive to nimal life, killing insects and vermin, and is especially useful in destroying contagion spread by such gencies. The method has the dvantage of cheapness, ease of aplication, and procurability. Sulhur can be bought in one form or nother everywhere. It has the reat disadvantage of being very estructive. It bleaches many yes, corrodes metals and weakens lmost all fabrics.

What is known as the "pot method" is the best way of using ulphur. Place the sulphur in a at iron pot, which is in turn put n a tub of water, resting on its eet, or else on bricks. The water essens the danger of fire, and furishes the moisture which is necesary to make the method efficient. The sulphur is lighted by hot coals. ive pounds of flowers of sulphur nust be used for each 1,000 cubic eet of space. All cracks must be arefully sealed, and the room kept losed for twenty-four hours, as a ule.

In preparing percentage solutions nistakes are often made. For instance, if one wishes to prepare a o per cent. solution of a subtance, he must take 10 parts of he substance, and 90 parts of vater—not 100 parts of water, as s sometimes done. In the latter ase of course one obtains a veaker solution than is intended. The same is true of all strengths nentioned.

Extracts from Bulletin, 166, Wisonsin Experimental Station.

Having obtained a good bull to lace at the head of the herd, the owner should take such care of him s will help to produce good results.

The best cow of any herd will lways be a money-maker. Therefore, he man who has the best cow has a ertainty, while the one who has the oorest cow has an uncertainty, and o satisfaction with her.

The Object of Ploughing.

The object of ploughing may be said to be four-fold.

1. The loosening of the soil.
2. The stimulation of bacterial activity.
3. The destruction of weeds.
4. The burial of manure.

The first is essential in order to prepare a good seed bed and to enable the plant roots to penetrate more deeply, so that they can get nourishment and moisture from lower strata of the soil. A further advantage of ploughing is that it opens up the soil to the atmosphere, the oxygen of which changes the character of some injurious combination and renders it available for food fertilising material of a slowly soluble character. Not less important is the improvement of the moisture conditions of the soil caused by the loosening of the soil by ploughing. A friable soil allows the water to percolate down, and on the other hand the fine soil is able to retain more moisture, which, otherwise drawn from the lower soil by capillary action, would be lost by evaporation.

An important benefit of ploughing is the stimulation of bacterial life. This subject is now engaging more and more attention, and much remains to be cleared up, but it is certain that light, warmth, air, and moderate moisture are all beneficial, and all these conditions are promoted by ploughing.

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Lucerne.

A successful lucerne grower gives the following don'ts to prospective experimenters with this useful plant:—

Don't sow any "nurse crop."

Don't sow on freshly-ploughed land, no matter how nicely prepared.

Don't let weeds or grass get over six inches high without clipping.

Don't clip or mow when wet with rain or dew.

Don't let it stand if turning yellow; cut it.

Don't sow old seed.

Don't sow less than 25 pounds per acre, one-half each way.

Don't sow on land that will not yield 250 bushels of potatoes per acre.

Don't sow 25 acres, sow five.

Don't pasture it.

Don't put any of the rotten manure anywhere but on your lucerne plot.

Don't let water stand on it.

Don't let it go in a thin stand; disc in some seed.

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Bureau Work.

By W. W. Hargreaves.

Other trades have their unions! Why then should not the people on the land be better organized? At present they almost stand alone and consequently as a body they cannot exert the necessary influence on public opinion. Union is power and the common interest of of the man on the lând demands union. I would like to see the Agricultural Bureau such a force and power in the land that would combat the disadvantage and injustice which prevail to-day. To effect this the branch should be made popular and the meetings as interesting and instructive as possible. Their object should be to encourage interest in farming, gardening, etc., and to spread useful knowledge among the producers. In short, the Agricultural Bureau should be a mutual improvement society to everyone on the land or otherwise, if they are interested. It should be the means of furnishing to the young generation an education to fit them for their work and be the voice of the country on all questions touching the well-being of the producer. There are to-day a lot of Bureau Branches which hold very few meetings, and further, the attendance is sometimes small. Analyse the list of members, and they can be placed as follows:—First the working member, who attends regularly and tries to do his best to make the meetings interesting. Second, the shy members; some of these have an enormous amount of information stowed away, yet are too diffident to tell it to their brother members, and third, we have the indifferent and lazy member who fails to take any interest in the doings of his branch. Every member should try and do his best and tell his experience, whether it turned out good or bad.

It is not an easy matter, mont
after month, to fill up the pro
gramme, all should help and al
can help if they would only tr
There are some who think that
is beyond them to give a pap
or bring forward a subject fo
discussion, but meet them in th
field and you will find that the
have a store of good informatio
There are members belonging t
branches who have had years o
experience and whose experience i
worth relating, but they are sh
Then there are men brimming ove
with ideas of how things ought t
be done! Well let these me
bring out their ideas, and let th
world know of them and give the
a trial, which might be improve
on by other members by experi
menting. Then again we hav
the handy man on the farm wh
has a knack of making contri
vances that save time and ex
pense and labor! Let him brin
these to the meetings, in fac
anything and everything that wil
make the meeting interesting an
instructive. Also bring forwar
plants, grubs, weeds, etc., whic
could be tabled and help to mak
the meeting more interesting. Als
do not forget to bring along an
visitors who may be interested an
perhaps if they live in the distric
will become members.

Some districts need railways
others more frequent mails, other
again are interested in such ques
tions as locking the river, etc., an
we can only get them by provin
the country to be worth it. T
do this we must work as a union
we can thereby farm, garden, etc
to advantage, and have whea
crops, trees, etc., where now stand
scrub, only breeding vermin. It i
quite evident that railways, lock
ing the river, etc., is needed, bu
to prove this to the people of th
State, we must combine and wor
our land to the best advantage
and so attain maximum produc
tion. To do this we must experi
ment and extract practical agricul
tural science from what ever sour
we can, the best way being b
making our Bureau a success
which cannot be done unless we al
pull together. It is well wort
working for. Just imagine all th
scrub land which is now lyin
idle, covered with wheat crops
houses and gardens, etc., and ver
min a thing of the past. It is un
fortunate that in all things wher
union is required there are od
men who will not pull with others
this is one reason why the middle
man makes such a profit out o
the produce instead of it going t
the grower, but this must be over
come and only earnest persisten
work will do it.

C. H. LEHMANN

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SADDLES.—Gents—I claim to make and sell as good an article and Cheaper than any other House:—50/, 60/, 70/, 75/, 80/, 100/, 110/, 120/. For Silver Mounts add 5/. Racing Saddles, any weight, 50/, 60/, 70/, 80/, 90/, 100/. Exercising, 60/, 70/, 80/, 90/, 100/, 120/.

BRIDLES.—Good Useful Snaffle Bridles, 6/6, 9/6. Queensland, 8/6, 9/6, 10/6, 11/6, 12/6. Double Rein, 10/6, 12/6, 14/6, 16/, 18/. For Solid Nickel Bits add 3/, and Curb 4/6. Ladies' Double Rein same Price, only add for Round Reins, 3/, and Noseband, with Net, 2/6. Head-Stall Bridles, with Reins, strong 10/, 11/, 12/.

STRAPS.—Saddle Straps from 6/, doz.; Hobble Straps, 9d. 1/, each. Rings, 4d. 6d. good quality.

REINS, Single Cart, strong, 7/6, 8/6; Spring Cart 7/6, 8/6; Leading, 11/6 for 25 feet, 16/ for 36 feet; Cross Reins, strong, Waggon, 12/6, 13/6; Cross Reins, Buggy, Silver Buckles, best 14/6, 15/6. For folded hand parts add 6/ Bridle Reins, 2/6; Silver Buckles, 3/6.

HARNESS.—Carriage Harness for £15 up Best. Pair Horse, with pads, from £10 up. Pair Horse Ordinary Skeleton, Traces sewn in Hames, 120/, including Pole Straps; with Buckles in Hames, £6 10/, £7, £8, £9. Single Buggy or Trap Harness, you can have as low as £4 10/, but if you are wise don't go below £6, £6 10, £6 15, £7, £8, £9, £10, £11, £12. Best Value, and really a splendid line is £8. Spring Cart, with Square Saddle, £5 10/., £6, £6 10/, £7. Long Saddles, 5/ extra.

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Clipping Farm Horses.

The long thick coat of hair that acts like a warm blanket through the winter causes manifest discomfort in the spring, and the horse sweats profusely, and actually suffers from the heat on mild days.

As a rule, farm horses are soft in the spring, and when put to heavy spring work they perspire a great deal more than would be the case if they were kept regularly at work during the winter months. As the hair is long, the moisture is held in it, and dirt accumulates much faster than if the horse were covered with a short coat.

This condition, says a writer in the "Breeders' Gazette," had led to the practice of clipping all farm horses in some communities before putting them at the heavy spring work, and the general opinion of those who have to do with such horses, both in working them and in the maintenance of their health, seems to be in favour of clipping.

Experience shows that a soft horse with a long coat of hair, if left to stand on a cold day after perspiring freely, or if stabled without ample protection on chilly nights, is apt to take cold and be subject to other ills resulting from these conditions. If he is clipped in the early spring and a rug is provided for protection whenever he is left to stand in the open on a day that is cold or at night when put into the stable, it would seem he is better off than the unclipped animal.

There is no doubt that the clipped horse makes a better appearance than the unclipped animal in the spring. It is also stated by those who practise clipping that the clipped horse is more easily and surely cleaned and kept in good condition, for with a short coat of hair he accumulates much less dust, and the excretions of the body thrown off through the pores of the skin have a much better chance to escape.

A long winter coat is an admirable protection for a horse when he is not at work, but when man takes him in charge and subjects him to heavy spring work after the winter months of rest, he may make life more healthful and comfortable for him by clipping.—The Australasian.

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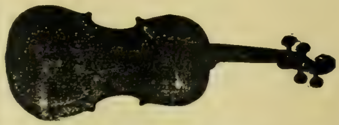

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Breeding Cows from a Good Strain.

It has been proved without a doubt that it is a fallacy to expect a common-bred cow, even if she is continuously stuffed with plenty of nutritious food, to produce as much milk of a rich and profitable quality as a cow bred from a milking strain. Hence the necessity of breeding from a sire descended from a strain of both quality and quantity.. A cow's biography is expressed, not in good deeds, but in quarts of milk. Dairying can only be expected to pay when conducted on right lines. Like other pursuits, there are many wrong ways, but only one right. The foundation of the whole business is in possessing good cows. This can only be brought about by a systematic method of testing the whole herd of cows, and when the dairyman realizes this, there will be some startling revelations, and ideal cows in the owner's estimation will go down hopelessly before the stern logic of practical test. Testing cows individually, and treating them on the merits of that test only, is the only sure and profitable way of increasing the output, and consequently the banking account of the dairyman. It is very often found that a cow which is an inferior producer is a large consumer of food. Say, for instance, the supposed best cows are large producers of a poor quality of milk—and, even if this were not the absolute truth, it often is—would it not be far more profitable to obtain the same quantity of butter or cheese from a less number of cows? So plain, simple, and inexpensive a thing as testing the cows has no difficulties, except the obstinacy of the dairyman himself, and in the near future the regular system of testing every cow in the herd must inevitably be a part and parcel of the operations of the successful dairyman. What steps have been taken by the general run of dairymen in the past to secure this end? In the majority of cases that have come under my notice, none whatever. They seem to be content with any mongrel of a sire; their chief aim seems to be in getting their cows in calf, forgetting the plain and solid fact that for the dairy cows of the future they will have to depend on the butter-producing qualities of the calves that are reared by themselves.

In the future, breeding and feeding, coupled with shelter (which is sadly neglected on the majority of dairy farms inspected by me), will be the dairyman's stand-by, for without green succulent food the cows can give neither quantity nor quality of milk. My experience has been that the production of butter from a cow is, in nine cases out of ten, dependent on her breed, for there seems to be a structural limit to the richness of cow's milk, and if a cow is fed to this limit, no feed seems to increase the butter yield. The character of the food no doubt has a good deal to do with the quality of the butter produced; but even here it would appear that the breed has a still greater influence on the quality of the butter; therefore, it becomes obvious that the future of our dairying methods depends a great deal upon the breeding, feeding, and shelter, and if the dairymen would insist on buying only pure bred sires, descended from a milking strain, and securing heifer calves selected from good butter-tested cows, the milk of the latter, when they came in, would be rich in butter fat. In conclusion, I say it is not possible to make dairying pay without providing abundance of green succulent food for the dairy herd throughout the year, a wholesome water supply, and plenty of shelter.—Victorian Journal of Agriculture.

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Home Treatment of Ailments in Cattle.

(From Live Stock Journal).

I first thought of heading these remarks "Every Man his own Cattle Doctor"; but that would be going a good deal further than is intended in the few modest suggestions I wish to offer.

Perhaps the day will come when technical education will become a real thing, and young men will be prepared, especially for their walks in life, and then farmers may be taught sufficient veterinary science to enable them to dispense with the services of the professional man for the treatment, at least, of many simple diseases. I have heard it said that in order to hold his own in these times an agriculturist should be a chemist, a botanist, and a mechanical engineer, and it may well be added, a veterinary surgeon. As things are at present, however, we cannot dispense with the professional veterinary, and he will always be required for serious cases of disease or accident, yet I feel sure that many a stock owner is paying a long doctor's bill which might easily be reduced without detriment to his cattle and to the benefit of his pocket.

Who does not know the mother of a family who runs to the doctor for every trifling ailment, and then complains of his bill? In the same way there are many owners of valuable stock who do just the same thing. Amongst all the ills to which bovine flesh is heir, there are many which yield readily to simple treatment, if it be applied with ordinary intelligence and promptitude. Often, indeed, the question of time is all-important, for the veterinary surgeon may live many miles from the farm; when summoned he may be away on his rounds and arrive too late to save an animal's life; while the possession of a medicine-chest and a little knowledge on the part of the owner might provide a "first aid" which would probably turn the scale.

It seems only reasonable to urge on every stock-owner the advisability, and even the duty, of acquiring at least some fundamental knowledge of the more common diseases to which his stock are always liable, and a very limited amount would enable him at once to see whether or no professional aid was necessary. It should also prove a safeguard against the dangers of ignorant blundering, of which the following is a striking example:—A valuable draught mare was suffering from simple colic, and the owner gave a dose of spirit of turpentine in linseed oil, which was administered through the nostril, with the result that she died immediately from suffocation.

Above all, we should never forget that prevention is better than cure, and there is one terrible foe to the cattle-breeder whose attacks are frequently fatal, but which can be kept at bay by preventive treatment. I allude to splenic apoplexy, milk fever, or, as it is commonly called, "dropping after calving."

At the risk of raising a smile, I will say at once that the treatment is homoeopathic, but, whatever it may be called, there is the strongest possible evidence of its efficacy. Deep-milking Jerseys are said to be peculiarly liable to the disease, and the following was the experience of the late Mr. Geo. Simpson, of Reigate. He had many cases which ended fatally, and his celebrated cow, Bessie, "fell" no less than three times, but fortunately recovered. I am not aware what gave him the idea, but he was induced to try small doses of aconite alternated with belladonna. Commencing immediately after calving, he administered ten drops of the mother tincture every four hours till four doses of each drug had been given. The result was complete immunity from further attacks. Having learned this from him, I followed his example in the large herd of Jerseys I then possessed, and the treatment was equally successful, for I never had a case of milk fever afterwards. The homoeopathic doses of the above powerful drugs are perfectly safe, and the cost is next to nothing, for a sixpenny bottle of each is sufficient for several cows. The marvellous action of these medicines has been explained to me as follows:—Aconite has been called the homoeopathic lancet, as in minute doses it lowers the action of the heart, and by this means relieves the pressure on the blood vessels of the brain, which is the cause of splenic apoplexy."

* * *

More or less grain is scattered on the farm; poultry become scavengers and turn all this wasted and lost grain into eggs and tender flesh.

Good butter is often made without either skill or care by mere accident; but to give any assurance of success you must add to the best facilities with skill and carefulness.

The Best Floor for Pig Pens.

The most important part of any and every piggery is the floor, and every effort should be made to see that this is in all respects satisfactory, even if the rest of the building has to suffer a little. Pigs can keep healthy and grow fat in a poor house if the floor is well-made, but there is a danger of their pining or falling sick on a cold, damp floor, even if they have a magnificent roof overhead. A broken floor, in which puddles of rain or urine can lie is a breeding-place for sickness and parasites of all sorts. Moreover, it gives the pig an opportunity of rooting, which he will generally accept, often to the extent of upturning the whole floor. The floor must therefore be made of some hard substance, which is not brittle and does not too readily break up. The best material for the purpose is concrete or Portland cement, though a useful flooring may also be made with a mixture of tar and gravel, stamped and rammed into a solid block. Care must, however, be taken in this case not to let it be too long exposed to the sun's rays, lest the tar melt and make the whole surface soft. Bricks cannot be recommended, unless they are new and unbroken, and, above all, are laid in cement at least six inches deep; even then they are liable to chip and creak. Stone flags are bad, as the manure sinks in between the joints, and makes the soil beneath impure; while wooden floors, unless movable, are wholly to be condemned as dangerous and mischievous to the last degree. Concrete should therefore be used wherever possible.

The preparation of a concrete or cement floor is well within the means of every man who can afford to buy a pig. It is not difficult to make. It should be laid on a gentle slope towards the front of the sty, with the top of the outer court lower than the bottom of the inner court by about two inches. There will thus be a small step between the two courts, which will enable drainage water to run away more rapidly. The object is to secure dryness underfoot, for this is not only more healthy for the pig, but it helps to keep the floor from splitting or breaking away. Small channels should also be made in the cement before it has hardened, and these should run diagonally, in parallel lines, and not cutting across each other in the way that is termed cross-hatching. These diagonal, or sloping lines should run from right to left in the inner court, and from left to right in the outer court. The slope of the floor should not be so great as to make it slippery, lest the pigs, on running out to their food, should hurt themselves: and for the same reason the surface of the cement between the channels should be slightly rough.

Concrete is a first-class material, and can scarcely be improved upon when well laid and properly grooved, for in such a case it is not only impervious to wet, but it conducts the drainage, and affords a firm foothold for the pig, which is an objection to the ordinary smoothly-laid floor. Great care must, however, be taken to ram the foundation of the pavement hard, for when this sinks in places the cement breaks up, and goes into holes. The importance of diagonal lines instead of cross-hatching will be appreciated by anybody who has tried to sweep out a pavement so constructed. With reference to bricks, this does not mean soft bricks, but hard, vitreous bricks, which must be well-grounded in cement. Asphalt is dangerous in a damp, greasy condition, owing to there being no foothold. Wood is bad in any form, except for the sleeping place, where there is an outer court, and then railway sleepers are useful. Rheumatism, to which pigs are terribly prone, is favoured by cold, damp floors, as well as by an exposed aspect.—British Board of Agriculture.

* * *

It is a mistake to think that pedigree breeding, as it is termed, has little or no value in respect to commercial sheep.

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The Poultry and Kennel Club Show.

Judging by the number of entries and the interest shown, there appears to be still a pretty vigorous kick left in the Society, with good prospect of a continued hale and hearty existence for many years to come, notwithstanding the recent amiable suggestion that the time had come when it might reasonably be expected to bury itself and so await a glorious resurrection on approved utilitarian lines. We have not heard that the committee has as yet evinced any marked desire to embrace the proposal, probably members are a little dubious as to whether the Government, after recent sad experience of the results of "utilitarian" methods would finance the affair. Still if the proposer can persuade the Government to guarantee another £10,000 for utility purposes, we, on our part, feel quite safe in saying that the committee, however composed, will make things hum for quite a long while. We don't fancy his chances somehow, especially, with Mr. Wilson's fish hawking scheme looming in the more or less remote distance. Still hope springs eternal in the most hardshelled breast as the poet so sweetly sings. By the way, Mr. Wilson does not seem to enjoy much luck in his commercial operations. Last time he had the goods but couldn't find a market, this time, so it is understood, he feels safe about the market but the fish appear to be shy. Uncommonly unpleasant of them, when there is a Minister of the Crown waiting to turn an honest penny for his King and Country and incidentally learn a useful trade to which he can retire. But about the show. The entries were good. The arrangements were first class. The attendance was better. The weather was rather worse than usual. The secretary was as cheerful as ever. The judging was as good as ever. The committee were as busy and useful as ever.

In Dorkings one missed Mr. J. J. Gabb's usual long string of birds. Mr. Gabb is in England at present, probably resting after a modest but, we hope, pleasant participation in the Coronation festivities. W. A. Jones, of Coromandel Valley, penned several nice birds, the special, however, went to B. Hewlett for a very fine silver grey cock, a bird of real good shape and excellently sound clean colour. Mr. Milford entered a Cochin, a nice coloured hen just to show that the breed still exists. Only a small entry of Langshans faced the judge. Hattam in old bird and W. A. Jones in young ones doing the winning. Special to cockerel of good colour and body, not one of the stilty ones. Thirty-five cocks were shown. Cope, Manuel, and Sargenfri Poultry Yards dividing the tickets. Mr. Manuel asked us some time ago, whether any one breed stood out as likely to have a run. The answer Barred Rocks was easier than some poultry questions. Mr. Manuel followed our advice to "buy and buy good ones" to some purpose for during a recent visit to Melbourne he added to the stock he already had, to such good purpose that 1st and 2nd hen, 1st and 3rd cockerel, and 1st and 2nd pullet—a really fine team—fell to his birds. In cocks S. Cope, who is, through lack of time, unfortunately giving up the breed, took 1st and 2nd, there being very little between them and the third bird. In A. O. C. cocks Cope won with a white. A very fine pullet of the same colour by same owner taking the ticket in females. Only four birds, Whites and Buffs, in these classes, and we doubt whether there is room for either of them. Black Orpingtons, always the best class in the show, were well in evidence. As to quality, if there were no champions, there were a lot of above-the-average birds in the pens. Honours in the old stock went to Sargenfri. 1st cock, a bird of good breadth and depth with fine carriage. Same owner's winning hen, was well placed, plenty of size, no coarseness and grand colour. Second and third to Wimble with two birds of the all-round quality visitors expect to find in his entries. Two V.H.C.'s went to L. H. Muecke for birds which appeared to us of a particularly pleasing type. Of sufficient but not excessive size with no looseness in build or feather, sound colour, though lacking the sheen of some of those above them, showing neatness in head points with active vigorous carriage, they might be taken as marking the point at which the "fancy" standard and the highest development from the utility standpoint meet. A point from which, wide departure in the one direction is to be deplored as tending to exaggeration, whilst any lessening of quality and type for problematical gain in utility would be equally undesirable as depreciating the magnificently useful "ideal" of the breed. They were perhaps a little dwarfed by an unnoticed hen in the next pen (65) which served as an excellent contrast. Some judges would, no doubt, have placed her after, if not before the winner in the class, and on the form of a year or two ago she would have certainly won. As a matter of fact the bird admirably illustrated the point of exaggeration referred to. She had

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great size, breadth and bulk together with grand colour, but there was an all-over-the-shopishness which one cannot conceive to be consistent with the ideals of the makers of the standard. The fancier does not breed primarily for utility and it is undesirable that he should, but he will be wise to confine his efforts to perfecting detail of type rather than to emphasizing if not exaggerating it unduly. Mr. Hobbs has been judging Blacks for some years and we believe that we can read in the trend of his decisions agreement on the point we have just tried to elaborate. By the way, may we be forgiven for taking an individual bird as the text of this small sermon. In the young classes, bad luck with early hatchings and early sales barred the Sargenfri Yards, Mr. Wimble's most formidable opponent from entry with the result that the Gilberton breeder made what must be a record, viz., 5 cockerels entered, all carded, 1st, 2nd, 3rd, V.H.C. and H.C.; 6 pullets entered, all carded, 1st, 2nd, 3rd, V.H.C., H.C., and H.C. It was magnificent, of course, but we question whether it is good policy. Poultry fanciers are a fairly sporting crowd and the Black Orpington opposition is quite willing to take a moderate gruelling from year to year without flinching but no opposition can be expected to enjoy being wiped out of existence. The only two crumbs of comfort, V.H.C. cockerel and V.H.C. pullet were picked up by L. H. Muecke. Buff Orpingtons have of late years been somewhat in eclipse. Whether they will ever again take as high a place as they did four or five years ago may be doubted, though we have no hesitation in saying that they will come again and come strong. Quality has been sadly absent since the days when Messrs. Hobbs, Laidlaw, Shearing, Collins, and Southwell, were big exhibitors. Mr. Blee is to be congratulated on having taken a big step forward in this most beautiful variety of the popular Orpington. His four firsts in the four classes with special for best Orpington with a number of other tickets to follow were thoroughly well earned. We have seen as good coloured birds before but in minor points and more particularly in a closer approach to the desired type, his team would stand high in comparison with the best of the buffs yet shown in Adelaide. It has been an uphill game, for there has of late years been little opportunity of obtaining assistance from outside sources, so that Mr. Blee's work has been entirely off his own bat. No breeder is more thorough in his methods than Mr. Blee, and none deserves or, we believe, enjoys success more. The 1st cockerel and 2nd pullet shown were, Mr. Blee told us, full brother and sister as well as nest mates and it was these two birds which particularly pleased us as indicating a line of breeding from which very good results may be reasonably expected. What a fallin off in Wyandottes! Only about half the usual entry. We missed several well known names, we hope only for a time. In silver laced cocks, Cope, 1st, a well shaped, clean topped bird. Same breeder, 2nd, grandly laced from throat to hock. W. A. Jones, 3rd, we have seen worse birds win. Silver hens, two good birds, apparently a toss up for winning card which went to Manuel. Two cockerels only by Cope. It is not very long ago since any shape was good enough to carry a well laced breast. These birds were Wyandotte shape as well as Wyandotte marked, and the combination certainly more than doubles the beauty of the bred. Silver pullets, only four penned. We have seen over 30 at the same show, but have not seen four better ones. Cope, 1st, sp. best Silver Wyandotte and Champion best Wyandotte in show, these two ribbons presented by Wyandotte Club. Mr. Cope left his 1st and 2nd Melbourne pullets in the Eastern capital, but in this bird he reserved a beauty for our show. Beautifully shaped throughout, cleanly and evenly laced with very solid black, clear hackle, neat head, good legs and feet about sums her up. 2nd, Manuel, a stouter built bird, running winner close in colour but failing rather badly in hackle, 3rd, Cope. Failed to the others in type but a good one. In Golds, Cope again had it all his own way, with a particularly fine even team, except 1st cockerel to J. C. Herriot, a grand fronted bird. Mr. Herriot has shown us many excellent golden cockerels but he will probably agree that this was the best to date and by a fair margin. Mr. Smith gave him the club ribbon for best G.W. Whites were the only variety to turn up in anything like usual numbers. 1st, 2nd and 3rd cockerels to the invincible Sid. The first bird, Mr. Cope told us, was one we picked at this show last year when an unnoticed cockerel, as having the the makings of a more typical Wyandotte than any we had seen and he has certainly fulfilled his early promise. Reckon him as just what is wanted in White Wyandotte males and you have his picture. We did not see Mr. Smith but no doubt he had him close up with the silver pullet for best Wyandotte in the show. The second bird was the Melbourne winner, but to our mind he was points behind. In hens Cope, again 1st, 2nd, 3rd. Good birds, of course, but not in anything like full bloom. The young classes were quite a triumph for S. Oliver. Mr. Oliver has been pulling up into the money for the last two or three years and one can now congratulate him on having fully arrived. 1st, 2nd, 3rd cockerels; 1st 2nd, 3rd pullets, is good enough reading. Big, bold, shapely birds right through and very well shown. Mr. Oliver evidently has strong vigorous stock, an admirable foundation, and any further improvement will be in the direction of refinement rather than the

(Continued on page 136).

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Line-Breeding.

(Continued from July Issue).

Towards proper selection of the male a number of points must be considered, but first of all must be true breed characteristics. This includes true form or shape, the proper head belongings and every feature that stamps upon him his breed of family characteristics. There is one feature, shape, that is much too often overlooked for color. When good color is obtained from such we may find shape gone when most needed. For this reason start with the best shaped specimens to be found. Following this in importance is size, with which must be joined constitution and vigor. Do not confound size with weight. Size should mean just what it indicates, and should not be determined by weight. A bird of proper size is one that is beautifully proportioned in all sections to the limit of size within which the proper breed formation can be maintained. This same rule should govern small size in Bantams, which can be so small as to lose their breed formation. This proper size, coupled with good lung power, strength and vigor, fulfils the second requirement for success.

Color, as one-third of the standard demand, is the third consideration, but in considering it remember that it is most in evidence all the time, and has by far more consideration at all times than is indicated by its numerical proportion. There is but one rule to follow in this, and that is to have the very best color at all times upon your breeding birds that is possible to obtain within the rule that governs color possibilities with the breed and variety you select. It should be well understood at all times and with all breeds that it is quite as important to have good color as good shape, and vice versa; for it is only possible to have the best in this way.

These same laws should govern your selection of the females. The real value of the hen as a factor in the upbuilding of a strain cannot be overestimated. Understanding this, it is also well to remember that size and general makeup is very largely influenced by the hen, while color and finish comes largely from the male, who wields great influence over comb, head points and its belongings, including the eyes. All these features must have your consideration at all times while guiding your matings toward the future. The proper consideration and study of these points saves to your flock the constitutional vigor you so much need.

Beak, shank, bone formation and muscle must come in for continual attention. Color and finish are the important factors with the former. Bad color and rough, unfinished shanks can be as thoroughly bred into a strain as any other feature, the obliteration of which should be guaranteed by its total absence at the start, backed up with continued care. Good bone formation assures strength and size; the proper muscles build out the wing bows, giving the broad shoulders and widening the thighs, preventing the narrow breast and contracted knees which give the pinched appearance. Those who pay strict attention to all these points from start to finish should succeed in building and maintaining a valuable strain of any breed or variety they select.

— Methods of Mating. —

In the three hens selected you have matured size, form and color, as hens they should show their full qualities in this line. If any shortcomings have been hidden under the bloom and glow of youth they usually develop in the hen. For these reasons hens are most desirable for breeders for this purpose. These hens, mated to the selected males, give you three distinct lines of blood in their offspring, all of which should be carefully toemarked so as to indicate the mother hen. As the chicks develop you will readily discover the best producing pair or the pair that may produce the best males and another pair that produce the best females. All this knowledge is of vast importance in the matings to come.

No trouble is experienced by those who have full knowledge of the real producers of quality, providing they have that quick perception that prompts them to grasp the advantage presented and perpetuate its valuable influence into future products. If one line from a single hen is by far better than all the rest, select this apart for future use, discarding all the balance; and to aid in your work secure, if possible, a full sister of the mother of the best, the product from which can be used for maintaining strength and vigor.

To follow your matings in this line breed together the second year brother and sister, the parent sister, the parent pair, also the full sister of the hen, of the best you can secure, with the original male. This gives sons and daughters of the original pair to make

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use of the third year for pairing with the product of the second year. Thus you should proceed each year. When selecting the produce of the year always assure yourself as to the pair that produces the best, and make use of them alone the following year to produce separate or new blood for strengthening your lines the following year.

If you have a well established line do not disturb it by bringing in new blood through a male. Always depend upon the best females you can get. If, however, you are weak in the quality of your males, secure the very best male you can find and mate him to one or two females of your own line that you know have produced the best males you have bred. If in this way you get better than formerly, it will be safe to make use of one or two of the best of these males. Work them continuously into your flock and watch the result, for a wrong move may bring very had results, which may be quickly remedied if but few of the new have been raised.

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The 300-Egg Hen.

Now that we know to a certainty that the 250-egg hen is a reality, and that six hens have averaged 260 eggs in one year, we are led to inquire, "What is the limit?" Will we ever have the 300-egg hen? If not, why not? When we consider that the original jungle fowl laid only 25 or 30 eggs in a year, and these in the spring, we can get some idea of the wonderful improvement that has taken place in the egg-producing proclivities of the hen since she was first domesticated by man. If we can coax her to lay 260 eggs where originally she laid but 25 or 30, why can't we go on and get her to give us 300 eggs in 12 months? Or have we reached the limit?

There are 365 days in a year. Give the hen 65 days in which to get through the moult, and she has 300 days left. What's to hinder her laying an egg each of these 300 days? She would have to be a non-setter, of course, as she couldn't waste any time hatching eggs and raising a brood.

Compared with some other creatures, the hen is away behind the times, even if she produces 300 eggs per year. For instance, the white ant is said to lay 80,000 eggs in a day, and an oyster is credited with producing 1,800,000 eggs in a season. The hen does better than the snake, however, which lays from 16 to 20 eggs in a season, and she runs a close race with the turtle, which produces 150 to 200 eggs during the season.

— The Profitable Hen. —

Someone has figured that a hen must lay 60 eggs in a year to pay for her keeping, and that all above 60 are clear profit. It makes a big difference, of course, when the eggs are laid. If it be in early summer when eggs are worth only 8d. a dozen, the 60 eggs would not pay the bill, while if she laid them during the winter when they are worth from 1/6 to 2/- per dozen, there would be a nice profit above the cost of her keeping for a year.

It is the winter-laying hen that pays the profit. The heavy layers—200 to 250 eggs—must of necessity lay at least half of their eggs in the winter because they could not possibly crowd them into the spring and summer months, counting out the broody and moulting periods.

The estimated cost on an average for ordinary feeding is 6/- per head per year to keep a flock of hens where all the feed is purchased at market price. This is probably somewhere near correct. It does not take much figuring to show that a hen laying over 200 eggs per year will pay a handsome profit. In most markets eggs will average at least 9d. per dozen the year around. Looks good, doesn't it? If—mark that "if"—a fellow has a flock of 200-egg hens, and enough of them, he has got a good thing.

— The Trap Nest. —

The trap nest has been an important factor in the development of heavy-laying strains of fowls. By the intelligent use of the trap nest or the single pen a poultryman can know to a certainty which hens in his flock are producing the most eggs, and by mating these hens with males whose dams are known to have been prolific layers, he can in a few years build up a flock of hens that will yield a nice annual profit. Not only can he know which hens are the best layers, but the trap nest will tell him which are the best winter layers, and these are the profitable ones. It will do more than this. It will tell him which are the drones in the flock—the non-producers and these can be weeded out and sent to market. In every flock there are a certain number of hens that do not lay enough eggs to pay for their keeping, and the sooner they are disposed of the sooner will the aggregate profits increase.

Then, again, there is an occasional hen that never lays an egg during her lifetime, although she may be vigorous and healthy, and to all outward appearance one of the most promising hens of the flock. She may go on the nest daily and cackle, and make as much fuss as the greatest layer in the flock, but she never lays an egg. She can fool her owner, but the trap next finds her out.

Here's to the 200-egg hen. May her tribe increase, and may some of her descendants make a new record by producing 300 eggs in a year. Let's abolish the limit for the next few hands and play the game for all it is worth."

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One of the results of withholding lime from pullets is that they eat their eggs. When lime is supplied, they do not acquire the habit.

Fowls not infrequently die of hydatis, and it is only reasonable to assume that a great many more succumb to this disease without the fact being detected. There is said to be no cure for the disease. A usual symptom is lack of appetite, mopishness, standing in a very up-right position, with hindquarters depressed. Post mortem examination will reveal that the abdomen contains a considerable quantity of water. The bowels will be empty, and covered outside with lumpy growths, some resembling bunches of grapes or miniature eggs.

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CURES COLIC, CHOLERA, AND DIARRHOEA IN ALL FORMS.

PRICE 1/6 and 2/- PER BOTTLE.

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TICK

South Australian poultry owners have found that the very best remedy for the TICK CURSE is

Faulding's

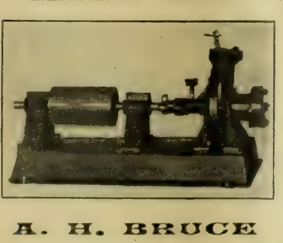
Phenytas.

Periodically dip the infested birds and spray infested houses and runs with Faulding's Phenytas and there will be no further fear of tick.

FAULDING'S PHENYTAS is Absolute DEATH TO THE TICK

(Continued from page 133).

reverse. In Cope's first V.H.C. cockerel, just a chicken, we had a bird which will take a lot of stopping when he developes. The only other class to show marked improvement was the Leghorn section. Browns showed a big increase in numbers and the quality was much above the average for this show. In this class and the whites Mr. Pitman must have had some difficulty in sorting out the winners. W. C. Bennett in taking 1st in each of the four young classes was easily the most successful exhibitor. The winning white cockerel stood out, a racy customer, nothing squat or heavy about him, quality from beak to toe nail, a trifle coarse in comb but well placed and well serrated, good eye and lobe, fine flow of hackle, good legs and feet, well carried tail, sickles well curved but would be improved if a little fuller in the web. The pullet was also one of the best, not too big, good length of body, nicely feathered throughout, beautifully clean feet and legs and a grand head piece, lean and clean. Thirty-eight Game Bantams faced the judge. Black Reds made a nice class. Special for best Game going to D. Cruickshanks with a grand little hard feathered cock. In Variety Bantams F. Goodwin penned a couple of cockerels in the pink of condition. In hens Naismith and Hill put up a couple of birds which would appeal to any lover of this delightful variety. To small bodies, of good colour with correct eye and clean lobe and well placed neat combs they added a greater degree of carriage and style than it is at all common to find in rosecomb hens at Adelaide shows. In Japanese, the same firm made a big entry. In black-tailed or white cocks they scored with a white which won well in class but which was, we thought, somewhat lucky to get the special for the best variety Bantam. 1st in hens went to same breeders with a charmingly low set full feathered little white. Seabright's only found four entries. Winning hen by Naismith and Hill, very clean, narrow laced, well shaped feather throughout. D. Cruickshanks 1st for exhibition pen with a nice level team of five Black Reds, an easy win from Naismith and Hill, same variety. In ducks the entry was fair in numbers and good in quality. A. M. Disher showed a trio of first class Aylesbury. In Pekins P. C. Manuel turned up again and annexed the four firsts. Mr. Manuel is evidently a breeder who will make a success of his hobby, for he knows the value of good stock and money does not stop his getting it. In Runners Sargenfri Poultry Yards penned the usual attractive exhibit in all classes, with usual success. In side shows D. Lanyon, had his accustomed exhibit of "Simplex" incubators and fixings. The "Simplex" stand is always one of the most popular points in the hall, the numerous broods of chicks which occupy the well devised coops and by their vigour and briskness do honour to their "Simplex" hatching, always attracting interested groups. We were glad to learn from Mr. Lanyon that business in this old favourite machine was extremely brisk. Messrs. E. B. Cox & Co., as the proprietors and manufacturers of the well known "Chick Vital" and sundry other poultry, dog, and bird preparations had a considerable exhibit of their wares on view. In addition, Messrs. Cox are local agents for the renowned "Spratts, Ltd," and are therefore well qualified to supply fanciers with all requirements. "Anything in the dog, poultry, and bird line," is their motto, "and everything good."



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Balaklava P. & K. Club Show.

The Secretary of the above Club kindly forwards the schedule of the show to be held by this Society on August 9. We find the classification extensive and well arranged whilst the prize money is allotted on a liberal basis. Town breeders would we think be wise to make a point of being represented not only because it is good to help others for it is even better to help oneself, and we gather from the representative character of the committee and their evident desire to make this show a popular and useful institution, that Balaklava is likely to become one of the most important poultry centres out of Adelaide. The judging has been placed in the safe hands of Mr. G. M. Duncan both in the poultry and dog sections. The entry fee for those who join the Society (subscription 5/- per annum) is 1/- per entry, non-members, 2/-. Entries close with the Hon. Sec., Mr. H. H. Kirby on August 4.

The name of "Lehmann" is one that for very many years past has been honourably associated with harness and saddlery throughout the State, with the result that Mr. C. H. Lehmann, of Grenfell St., Adelaide, has secured a reputation second to none for the excellence and quality of his manufactures. The harness turned out by him has stood all tests, and for cheapness finish and durability is claimed to be unequalled, whilst his collars are pronounced by farmers who have used them to be the best that money can buy. Those requiring saddles cannot do better than to inspect the large stock which is carried by Mr. Lehmann; should, however, a special line be required in this particular branch of the trade, the customer need only give instructions, and one will be made under the personal supervision of the head of the firm. Much has been said during recent years regarding the beneficial results obtained by the rugging of cows during the cold months, and the rugs manufactured by Mr. Lehmann are simple, effective, and cheap. Always of an inventive turn of mind and sympathetic nature, Mr. Lehmann for long deplored the suffering and inconvenience experienced by persons—and more especially children — who, owing to weak ankles or deformed feet, have in the past been obliged to wear boots with side-irons and other hideous contrivances. As a result of study and practical experiment, he has devised what may be styled a sandal boot, which besides being absolutely rigid as far as ankle support is concerned, is neat in appearance, inexpensive and practically everlasting. As a mould is taken of the foot a perfect fit is guaranteed. The invention has been warmly welcomed by leading members of the medical profession, who have sent their patients to Mr. Lehmann for treatment with highly satisfactory results. Children who were only able to limp painfully with the barbarous leg-irons on using Mr. Lehmann's sandal-boot have been at once able to walk with ease and comfort. Weak knees, spinal curvatures and other physical defects have been treated by Mr. Lehmann in the same way with equal success, and we advise any so suffering to lose no time in consulting him. A perusal of Mr. Lehmann's price list will show that, in his case, the recent general advance in prices, has been very slight indeed, and that his prices taken all round, compare more favourably than ever with those of his competitors.

Chickens Dying in the Shell.

— A Thoughtful Article on an Important Subject. —

Last year I conducted experiments with a 100-egg machine, in order to find out for myself a few facts regarding artificial incubation. As I think some of my results will at any rate be just worth recording, I will give them for publication. I started the machine in a small room on the second floor, and kept windows and doors (three) shut. I kept the temperature at 102 degs. for first week and raised to 103 degs. to 104 degs. for the rest of the time. I plugged the ventilation holes very lightly with cotton wool, and the central inlet at bottom of machine in the same manner. I used no moisture for first fortnight. The eggs were from matured buff Orpingtons, i.e., birds in their second season, turning once daily in morning, and airing every evening for from ten up to twenty minutes. Out of twenty-nine fertile eggs only seventeen were hatched and many of these were helped out, and some three or four were too weakly to do well, so were put out of the way. The eggs failing to hatch had died at various dates from fourteenth to twenty-first day.

Another batch of eggs which totalled forty-four fertiles, comprising buff Orpingtons from same birds as before and some Campine eggs from pullets, were subjected to much the same treatment, except that the ventilation holes and inlet were plugged tight. This apparently did the trick, because I succeeded in hatching none. One egg billed. I helped it out, and as a reward for its pluck I made away with it, as there was no single bedroom in the foster mother and I had no hen handy.

I was determined I would sacrifice no more eggs for the sake of science just at present. I had wanted to find out if an impure air would really kill the embryo chicks. I felt quite sure that they would suffer, but I wanted to find out to what extent.

Now comes a different tale. I filled the machine once more, and removed all plugs, opened the window, and kept it open during the whole time, and kept the doors of the room open. Turned and aired as before. Fertile eggs numbered eighty-four (sixty-three Campines and twenty-one Buff Orpingtons). On the ninth day I commenced using pure oxygen, filling the drawer with the gas three or four times during the day and once the last thing at night, lightly plugged the ventilation holes with wool after ascertaining the fact that pure oxygen was coming through them. I kept up this treatment until the end of the time, and seventy strong chicks left their shells as clean as you could wish. Of the unhatched eggs four were from a Buff Orpington hen which had been suffering from diarrhea, and the remainder were from the Campines. I do not see any reason for thinking that these would have hatched even under hens. They showed signs of failure about the tenth day, and from that to about the eighteenth. During the time that this batch was incubating, I had under hens eighty-four fertile eggs from Buff Orpingtons. Result: Seventy-eight chicks, two addled, two half-developed, and one fully developed, but so placed in shell that it could not bill its way out.

These eggs under hens were set and tended in the most correct and satisfactory manner possible. They were from birds kept under the best possible conditions, and I know, not inbred, and yet a few were "dead in shell."

My deductions from my experiments are that the most important thing to secure in artificial incubation is that the eggs be able to come into contact with pure air.

Inquiry into the circumstances which influence, or seem to influence, the result of artificial hatching by my friends, has led me to observe that the airier the room the better the results and the best results are generally in an outdoor shed. Here, to my mind, is another strong piece of evidence in favor of "air," not "cooling."

In the case of the sitting hen pure air filters through the feathers and nest material without any difficulty and the eggs are practically always in contact with a certain amount of oxygen. At the same time, it may be noted that any moisture evaporating from the eggs tends to be condensed upon the feathers as it nears the colder air outside, and so much of it is probably in a state of preservation underneath the hen.

Eggs! Eggs!

Sittings from Heavy Laying

White Leghorns
Black Leghorns
Black Orpingtons
Silver Wyandottes

15 Eggs to each setting. Guaranteed fertile or replaced. 10/6 per setting.

T. E. YELLAND,
S.A. Farmers' Co-Op. Union, Ltd.

To sum up, it seems to me that the lamp of our incubators exhausts the atmosphere in the room of the greater part of its oxygen, which is a vital necessity to the eggs, and if there are any germs weaker than others they must surely fail at the time when oxygen is needful for their development, which is from fourteenth to twenty-first day. A perfect incubator, to my mind, should allow of the filtration of air through porous material to the eggs within, and if two or three layers of light felt, separated by a narrow space, were to form the sides and bottom of the egg drawer, and the source of heat be derived from some generator outside the room, it is my belief that every hatchable egg would undoubtedly yield a chick if the atmosphere of the room be pure.—"Medicus."

Where there is no gravel in the soil supply-plenty of grit in some form. Broken crockery in small pieces, broken oyster shells and gravel answer well, while crushed green bones are a fine egg-producing feed.

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American "Ringlet" Strain. Barred to the Skin.

Winnings last year:—8 Firsts, 7 Seconds, 6 Thirds, and 2 Trophies for Best Rock in the Show.

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Our Matings this year are better than ever. As we believe the **Barred Rock** to be the **Coming Breed** for Show and General Utility, we confidently recommend this line to our friends. **Eggs £2 2s. and £1 1s.** per doz.

Some Grand Young Stock for Sale.

BLACK ORPINGTONS.

In Black Orpingtons we can offer Eggs from our best pens, in which our noted winning "Sargenfri" King "Sargenfri" Prince blood is well represented, at usual prices, **£2 2s. £1 1s. and 10s. 6d.** per dozen.

High-Class Young Stock.

WHITE LEGHORNS.

We have 400 well-bred young Leghorns ready for Customers. They are birds of good quality, and will turn into healthy, vigorous, heavy-laying stock. (N.B.—"Sargenfri" Leghorns lay standard size eggs every time. Eggs from all Pens **10s. 6d.** per dozen,

INDIAN RUNNER DUCKS.

Unbeaten in the Show Ring and Splendid Layers. A Fine lot of Typical Young Stock for Sale. Eggs 10s. 6d. per dozen.

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Artificial Hatching.

The art of hatching eggs by means of artificial methods is not a discovery of the present day, as for thousands of years in Egypt, China, and Siam, egg ovens have been employed, where chickens have been brought out without the aid of the hen. It is only during comparatively recent years, however, that incubators have been brought within the reach of the ordinary poultry keeper, as until towards the end of last century their price was altogether prohibitive. Nowadays an excellent machine can be procured at a low cost, so that this need not stand in the way of anyone who is desirous of employing artificial methods. There are scores of different machines on the market, the great majority of which are well made, and perform their work in a satisfactory manner. The great advantage possessed by artificial over natural incubation is that successful hatching can be carried out at all and any season of the year. An incubator is as reliable and hatches as many eggs, during the depth of winter as in the height of summer. It is herein the great benefit of artificial incubation lies, because during the winter months broody hens cannot be obtained with any certainty, and thus, if early chickens for the early layers be desired machines are essential. There are certain branches of the poultry industry which can be quite successfully conducted without employing incubators, but as a rule these are necessary to achieve the best results. Incubators involve less work than sitting hens, as a machine with an egg capacity of 100 does the work of eight hens. It is true the eggs require to be turned and the lamp attended to, but this occupies considerably less time than the feeding and management of eight hens.

There are two distinct types of incubators in use at the present time—the hot water and the hot air. I do not think there is much to choose between the two kinds so far as the hatching results are concerned, provided the temperature of the room in which the machines stand is fairly equable. If, on the other hand, the temperature varies a good deal, then the hot-water type is the better, as in this form there is a copper tank extending over the top of the egg drawer, and a large body of water takes longer to rise or fall in temperature than does a corresponding amount of air. In the case of the hot-air type, the upper part consists of an air-chamber, and, as will be readily seen, it is more easily affected by the outside temperature. This kind of machine is the one exclusively used in the United States, but this may be explained by the fact that there the incubators are always kept in an underground cellar, where the temperature remains very equal, varying but a few degrees between summer and winter, and probably not at all between day and night. The best temperature at which to work a hot-water incubator is 104 deg. for hen and turkey eggs, and 103 deg. for duck eggs ; in the hot-air type better results are achieved if the machine is run at 103 deg. and 102 deg. respectively. In Australia both types are largely used with apparently equal success. The general preference being, if anything, for the hot air machines.

Poor hatching results are often obtained owing to the fact that the incubator is unsteady, or that it occasionally receives shocks, and especially has this an injurious effect during the first week or ten days of incubation. If the machine is badly shaken, or is placed where it is unsteady, the germs run a risk of being killed. If they are strong enough to survive, the chickens, when hatched, will very likely be deformed. If it can be avoided, the incubator should not be worked in an upstairs room, as the floor in this case is never very steady. Whenever possible, the incubator should rest upon a strong table, or the packing case in which the machine has arrived, inverted, makes a very suitable stand. The incubator shed should be well ventilated, and, if possible, there should be some arrangement whereby fresh air can enter a few inches from the ground. This is important, as the fresh air which enters to the eggs generally passes in through a hole in the bottom of the incubator. The temperature of the room should vary as little as possible, and thus a south or south-west aspect should be avoided. If the windows face south, blinds should be arranged which can be drawn during the hottest hours of the day. The reverse aspect would of course be correct in Australia or South Africa.

The regular cooling of the eggs is an important point in the management of an incubator, because, unless they are cooled and turned, a large percentage of the chickens will fail to make an appearance, besides, which, those that do hatch will in all probability be weakly and delicate, involving a considerable amount of labour to rear successfully. Some practical poultry-keepers advocate cooling but once a day, but I have had better results when the eggs have been cooled and turned twice a day. It is true a little more labour is entailed, but the greater vigour of the chickens amply repays this. Twice a day, then, the egg-drawer should be opened wide, and the eggs allowed to become quite cool. The time the drawer should remain open depends upon the outside temperature, and it would be misleading to give any stated time. During cold weather five to six minutes is probably quite suf-

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THOUSANDS OF POUNDS WORTH OF EGGS

Preserved with

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ficient, whereas on a hot day twenty-five to thirty minutes is none too long; the aim is to reduce the egg temperature to about 60 deg. to 65 deg., and the time necessary to achieve this can soon be determined by a little experience. Without daily cooling the vitality of the chickens within the egg is reduced, and they will find more difficulty in making a successful exit. While the drawer is opened the eggs should be turned, otherwise the germs are likely to adhere to the shell.

All the hot-water incubators are provided with a water tray, which is placed beneath the egg-drawer, and through which all the fresh air that enters the machine has to pass. A piece of canvas is kept stretched over this tray, so that the air becomes thoroughly saturated ere it reaches the eggs. Owing to the arrangement of the air in a hot-air machine, the necessity for this water-tray is dispensed with. Once every day the lamp should be filled, cleaned, and trimmed, unless a self-filling lamp is used, in which case one filling for the three weeks of incubation suffices. It is a good plan to attend to the lamp in the morning, and then if it is working well by the evening there is small fear of its smoking during the night. As far as is possible, the lamp should not be altered after about 3 or 4 o'clock in the afternoon; it should on no account be altered the last thing at night. If the flues are kept clear, the lamp carefully trimmed, and the machine does not stand in a draught, there is very little danger of the lamp smoking. The greatest cleanliness should be observed in everything pertaining to artificial hatching; and between each hatch the machine, including the water-tray and the egg-drawer, should be thoroughly washed out with hot water in which has been dissolved a little soda.

While the chickens are hatching, the eggs should be interfered with as little as possible. It is necessary, however, to open the drawer every few hours, in order to remove any empty egg-shells there may be, because if they are allowed to remain some of them may get fixed on to full eggs, with the result that the chickens have two shells to pierce instead of one, which may cause death. As the chickens make their appearance they should be lifted out and placed in the drying-box in batches.

It is a good plan on the seventh day to test the eggs for fertility, a very simple and speedy process. The eggs should be held between the hands before a strong light in a dark room; then in a fertile egg there will be seen a spider-like form towards the broad end. An unfertile egg is quite clear and transparent. The benefits of testing the eggs are two in number. In the first place, the clear ones are quite good enough for cooking at the end of seven days' incubation, and, in the second place, they are not occupying valuable space. During dry weather it is a good plan to make another test on the nineteenth day, in this case placing the eggs in water heated to 103 deg. Eggs containing dead chickens sink to the bottom, while those containing live chickens swim upon the top, and are seen to vibrate. This is not much use as a test, as on the nineteenth day no good purpose would be served in this direction, but it is valuable in that it softens the outer and inner membranes within the shell, thus making the exit of the chicken more easy.—" Feathered World."

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From the Egg to Maturity.

A breeder when asked how he managed to raise so high a percentage of first class birds and if he would be good enough to give the show away, replied:—

First, have the best stock you can procure. Next, give them proper care and don't destroy the good qualities during the first ten days after they are hatched.

The best results I have had in raising fowls, have been attained caring for them as follows:—When a hen comes off with a brood I remove her to some convenient place where they can have full liberty during the day time, first having a coop so arranged that it will be vermin proof; then I visit them each morning to feed and also prepare some convenience to water them. At noon I replenish the water and at night I call around again and fasten the door of the coop. This is all the care I bestow on them and it is a rare occurrence for me to lose a chick.

By teaching them to hunt for their food they get what Nature has provided for their wants, and they exercise sufficiently to make them thrifty. I think it is one of the worst mistakes for anyone to overfeed chicks while young, if they are intended for breeding stock. But, on the other hand, the stuffing and crowding is all right if raising for market while young.

Thousands of chicks die before they are a week old from mismanagement or from being over fed. An overfed chick will develop into a lazy worthless fowl; they will stand around and wait for you to provide for them. I never want any of my chicks fattened till they are almost mature in size, but, of course, for shows, we want them reasonably fat.

I have also found that a fowl that has been overfed will have a greater proportion of objectionable plumage, or off color. Quality should be the main object. I have found that where the best birds are, as a rule, is where there are small flocks. Crowding too many chicks with a hen is one of the worst things that can be done. I would rather have five chicks, of good stock, that a hen would raise, than 25 raised by one hen. When crowded there are too many mishaps befall them. If you will notice carefully you will find that the best specimens out of a large flock are those from small broods.

Some one may ask what I feed. Well, I feed scarcely anything for the first week; I put sand where they can get it and as soon as they are able to eat it I give them crushed grain until they are three to four months old. Some may think this a strange method but I have practiced it for years with the very best of results.

"ONTARIO" WHITE LEGHORNS.

have twice won Roseworthy Egg-laying Competition.
World's Record for placing the first five pens in Blenheim Competition
1906-7, 100 pens competing.

I am offering eggs from Roseworthy winners at a very low figure to the first 20 applicants. This pen beat all Australasian Competitions held in open yards for 1908-9.

High class stock and eggs in season satisfaction guaranteed.
Telegrams—" Ontario."

T. B. BROOKS - - Clarendon.

Pigeons and Canaries.

Pigeon Notes.

By "Rambler."

Will fanciers and members of the Canary & Pigeon Club please note that 1911 pigeon rings can be had from the Secretary of the Club, Mr. F. W. Hocart, Clarence Park.

Messrs. Woodward and Mead are selling out their valuable stud of Jacobins, as they are going in for more Scandaroons, also more Magpies, which they are going to import from England shortly.

I hear of another good order to go to England shortly for three pairs of African Owls, viz., one pair whites, one black cock, and blacktailed white hen, also a good red cock and a blue hen. As these are going to be something real good, it ought to help the importer to produce some specially good youngsters.

Broken Hill is to the front is starting the breeding season, as some of the fanciers, I hear, already have several youngsters fit to be rung. Others, of course, have not mated up yet, or are just about to start to mate. Too early and too late are both bad complaints in breeding.

Mr. E. A. Grosser is again elected judge for all pigeons at the coming Kapunda Show. I notice that there is a £2 2/- special trophy offered for most successful exhibitor in pigeons.

O.K. LOFTS.

This is where the Champions are bred. At 1911 Sydney Royal we won 2 Champions, 6 Firsts, 3 Seconds, 2 Thirds with 11 entries only. At S.A. Pigeon and Canary Show we won the "Blondinette" Cup, the "African Owl" Cup, against 15 others also the "Short-face Tumbler" Cup for best young tumbler, all with home bred birds, also a number of Specials, Firsts, Seconds, and Thirds. To give amateurs a start I have for sale Blondinettes, African Owls, Short-face Tumblers, Nuns, Turbits, etc., from 5/- each. Fifty to clear before breeding season. Apply at once to—

E. A. GROSSER,

Hamilton, S.A.

City pigeon men ought to encourage country shows. Mr. D. Munro is Secretary.

A good team of Turbits recently arrived per s.s. Runic for O.K. Lofts, also a pair of Blondinettes, one being a good Red-laced hen, the other a clinking Blue-laced cock.

I am sorry to hear that Mr. Baulderstone is giving up pigeons. Let us hope that his withdrawal will only be for a short time.

The Poultry & Kennel Club Show was by way of being a failure in the matter of numbers in the pigeon section. What is wanted is more classes especially in Turbits, Blondinettes, Nuns, African Owls, and Tumblers. (With all due respect to "Rambler," we should say that what is wanted is a bit more sportsman-like willingness to enter, win or lose. In pigeons as in most of the other classes the need is for more competition not more classes.—Ed.)

Mr. W. H. Walker, of Sydney, is at any rate a good sport having sent teams to Adelaide, Melbourne, and Brisbane, without counting his numerous entries in his own State. I was glad to see his win of Special at last P. & K. for best Fantail with a lovely Black.

Blondinettes are well on the up grade, several good birds have recently arrived and now I hear of another fine team on the way out.

Mr. Viney, of Wright St., Adelaide, is one of the latest to go in for this lovely variety also Nuns and African Owls. His purchase in the two former being from the O.K. yards.

Mr. C. Duldig, of Gum Vale Lofts, has started in Short-face Tumblers, also in German Beards. In the former he has just received a lovely Almond cock and kite hen, with which he should be able to shake things up a bit.

Mr. G. Shee, the Victorian Saddleback fancier, has done a lot of winning this year, including the Saddleback Cup. He has, I, hear, just parted with the grand young Black Stripe cock, which was placed third in the Cup Competition.

Mr. F. W. Hocart, Hon. Sec. of the South Australian Canary & Pigeon Society, has done such excellent work in that position that fanciers will hear with extreme regret that he proposes to resign his post. He has done so very much to place the Club in its present satisfactory position that I hope the very strongest effort will be made to induce him to reconsider his decision. We cannot afford to lose a man of Mr. Hocart's ability, and one who knows the ins and outs of the pigeon and canary fancy so thoroughly.

Practical Pigeon Management for Amateurs.

By "Rambler."

As most of the important shows are now over, fanciers will be able to get their lofts ready for what is really the most interesting time of the year, i.e., the breeding season. I have always been very emphatic about the importance of having everything clean and this is of more importance than ever when the lofts are full of young ones, so start with an extra special turn out of the lofts. First take a scraper, a bit of hoop iron will do if you have not a proper one, and thoroughly clean out every bit of the house or loft. Then get some good hot whitewash and give the whole place a good thick coat. Work the brush into every hole and corner. Dip the nest boxes or bowls into boiling water and afterwards give them a coat of the wash. When this is done and done thoroughly you can be satisfied that you are giving your stock birds a fair chance in the matter of raising youngsters.

You know, of course, that you will need foster parents to satisfactorily rear the short-face varieties such as African Owls, Turbits, Short-faced Tumblers, Blondinettes, etc. Certainly they will occasionally rear their own young but the better the bird the less chance there is of their doing so. I mention this because I have known beginners suffer a good deal of disappointment and loss, through not providing feeders as they are called. Common pigeons do all right for this purpose. Working Homers, long faced Tumblers, Nuns, Magpies, or even Fantails which are not too finely bred will, however, do just as well and be much more interesting to have about. The eggs you want hatched can either be changed soon after being laid or may be left with the natural parents till almost hatching time.

Don't forget the importance of good feeding if you want your foster parents or natural parents to rear you good strong youngsters. I use maple peas, tares, canary seed and a little wheat. Remember that they want good clean sand, shell grit, some old broken up mortar and a lump of rock salt. The water should always be clean and fresh. To be sure of this change it at least once a day and scrub out the water vessels as often as you can find time to do it. Three times a week is the least number of times that it should be done.

The mating of pigeons is usually very simple. If you are using small breeding lofts for each pair all you have to do is to turn in the two birds, but where several pairs are to be run in the same loft, it will be necessary to first mate each pair separately, unless, of course, you are going in for indiscriminate breeding. To mate any two birds put them into a mating pen, that is, a cage divided into two by bars, through which the birds can see and touch each other. As soon as they are on thoroughly good terms, and are enjoying the courtship, the strutting, cooing, beak-ringing, tail sweeping, etc., they can be safely turned into the general loft, for in nearly every case they will be found to be safely "married" for the season. Accidents, of course, happen occasionally, when one or other of the parties select another mate on their own account, but the beginner even can soon tell whether things are going on smoothly or not.

Having got the birds in the breeding lofts, see that the nests are well placed. Sprinkle some fresh sawdust in them and a handful of dry sheaoak leaves if you can get them. I am a great believer in these leaves for they will not harbour insects of any sort. If these are not to be got use any other leaves or get some straw and rub it up well or some fine shavings chopped up. Dust a little insect powder over the nest before the first egg is laid and also a little two or three times during incubation.

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Victorian Notes.

By "Blue Rock."

The shows are now all over, and breeders are wearing their considering caps over the question of mating. I even hear of hatchings already, but I do not think anything is gained in the end by over haste. The ultra early squabs pass out in the frosts, the hens get over worked unless taken from their mates when the youngsters die, and the game is not worth the candle.

An interesting question is to be settled by the committee of the Victorian Pigeon Society, when a protest at present before them is decided. The facts are these :—In the Magpie classes Messrs. Woodward and Mead were dissatisfied with the cards awarded to some of their birds, and with the cardless condition of others. For the firm Mr. Mead entered a protest against the judging, and the judge admitted that in specific cases he had taken into consideration the fact that certain birds were young birds in old bird classes. He indicated the cards certain birds would have got but for the circumstances named. The society now has to determine whether it will overrule the awards or not.

The case presents two faces. The first is—was the firm justified in showing youngsters among the old ones? The other is—even though they were justified in so doing, is it desirable to pass a rule confining birds to their own classes?

The matter is one demanding grave consideration. The exhibitors involved are quite agreeable to fall in with any such rule if made, and made their entries in good faith, it is a common thing over this side, and has never been challenged before. It is worthy of remark that such a rule would debar unrung birds from competing at all—a not unmixed evil.

There is a boom in Fantails over here; in fact this variety is in high favour all over Australia, and deserves to be, to my mind. On the other hand, Turbits and Orientals are under a cloud in Victoria, whereas Tasmania and South Australia have some good specimens to boast of. Magpies are gradually rising into favour. Mr. Stewart was an absentee from the pens, some fiend having poisoned most of his birds. Mr. Stewart is not to be dismayed, I am glad to say, and intends to import a team. Good luck to him I say.

Mr. J. J. Young has disposed of his birds. He is highly delighted at having won the Vic. Society "Jack" Cup outright.

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Victorian Shows.

— North Suburban. —

Held June 27-29. Homers, Saddlebacks, and fantails were very strong, after them Jacks, Magpies, and Tumblers made a good display. In Homers Messrs. Nixon, Bendall, and Cole did very well, the former winning the cup for 1910 bred birds. In Saddles Mr. Shee won the Cup for best bird in the class, the same bird winning the special for best Fancy pigeon, this latter prize being awarded, I understand after close competition from Mr. Crotty's 1910 Fantail (special winner), and Woodward and Mead's young Magpie, also a special winner (silver medal and 10/6 for best Magpie).

In Jacks, Woodward & Mead won first in black cocks, and V. V. Cousins in black hens. In the other colours Mr. Crotty was on his own. In Fantails, Mr. Crotty was practically invincible.

— South Suburban. —

This show suffered badly owing to an unfortunate clashing with the North Suburban. Homers were strong, however, which is really an indication of the excellence and quantity of Homers in Victoria at present. The main winners were Messrs. Badham, Dunning, Woodward & Mead, Swalwell, and Haines. The Challenge Cup for best young Homer was won by J. Dunning with a fine bird. Saddles were a good class, Messrs. Hendrie, Murray, and Shee being the principal winners. In Magpies and Jacobins, Woodward & Mead scooped the pool. An interesting class was that for the ladies, for which Mr. Drayton had put up a washing wringer as special. With an eye to washing day, the ladies came along with a record entry of eighteen; the winner was Mrs. Ponsford, with a fine black Stripe Saddle; Miss M. Holmes scored second with a beautiful English Owl, while Mrs. Woodward was third with a snaky black Magpie.

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Poultry and Kennel Club Show.

— Pigeon Section. —

This section at the above show was somewhat disappointing to those who hoped that pigeons would show the same marked increase in numbers as in the more important ones of poultry and dogs. There were a number of good birds, the trouble being that there were not enough of them. In Carriers, Miller and Martin won. In Dragoons, C. H. Creer, and H. S. Gillies. Antwerp, S. A. Chambers. Pouter, E. Hefron. Turbit, Von Einem and T. Koerner. Blondinette, Von Einem. Show Homer, H. S. Gillies and F. Goodwin. In Working Homers the winners were G. E. Vick, L. P. E. Smith, H. P. E. Smith, and W. H. Milford. Magpie, T. Koerner and W. H. Walker. Tumbler, H. S. Gillies. Baldhead, W. J. Hughes. Beard, W. J. Hughes. Jacobin, F. Crotty and G. S. Ball. Fantail, H. G. Gray, W. H. Walker. English Owl, G. S. Ball. Turbiteen, D. Cruickshanks. Helmet, Miller and Martin. African Owl, Miller and Martin, G. S. Ball, and T. Koerner.

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WOODWARD & MEAD
PIGEON SPECIALISTS,
Have bred some sweet 1910 youngsters in
MAGPIES, JACOBINS, HOMERS, NUNS.
Prices to suit all purses.
G. J. MEAD,
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BALACLAVA, Victoria.

❁ Home Notes. ❁

The Girl With the Ready Smile.

"There's nothing half so sweet in life as love's young dream," sang Tom Moore years ago ; and an American novelist added later the words, "or the girl with a ready smile." As you drift farther on through life you realise how wise was that American novelist.

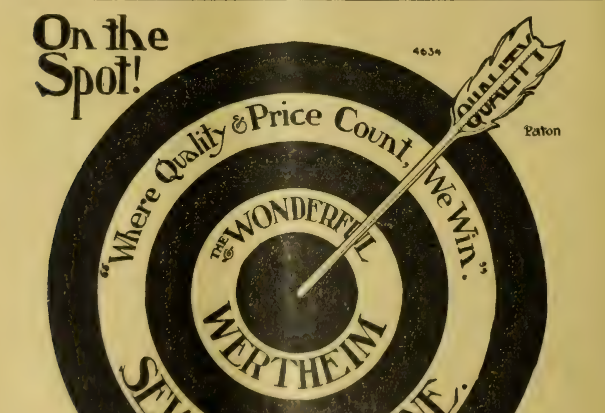
The girl with the ready smile ! —what a power she is ! You jostle against her in a crowd and turn round with a look of annoyance, which quickly disappears because a dimpling face is looking into yours, and a sweet- charming voice is saying, "Beg pardon." The girl with the smile has gone. It was just the episode of a second, but it leaves its mark, and the day is a little easier, the sun is a little brighter, because you have rubbed shoulders with a girl with a ready smile.

You meet her in your social or business world. She may be at an afternoon tea that is going dull, or she may be behind the counter of a crowded city shop ; she's just a stranger, probably an "outsider," but she flashes on you a look like one of God's sunbeams, and calls up an answering ray of brightness from your very soul.

If she smiles upon you in an hour of trouble, what a soothing balm her smile is ! Your heart may be all laden, but there seems to be a soothing something behind her eyes that means "I'm sorry." It somehow gives you courage for another fight. Years after, in other troubles, a little lingering memory of a glorious smile of sympathy comes back, and is again a potent power.

The girl with the ready smile is a God-send to this heavy-hearted old world. She is as an elixer to youth and age alike. The school boy, with his eyes fairly blazing, votes her "Bully," and the title is borne of the unlimited love and honour of his bohemian soul. Her girl friends call her a "dear." To older women she is a "really helpful girl." The old, old man watches her with a power of tenderness. She is to him a ray of sunshine that steals into the dark places of his memory. "That's just exactly what my old woman was—years ago—when we were—courting." His white head moves with a knowing nod, and his knotted hand brushes over eyes that have suddenly become bright. The very young man calls her "sweet" or "jolly"—but the blase man of the world's estimate of her is bound with reverence.

Yes, she's quite a power, your girl with the ready smile.



A Simple Test.

— To Distinguish Pure Wool Goods from a Cotton-Wool Mixture. —

Weigh a sample of the mixed fabric, then boil for twenty minutes in a 10 per cent. solution of caustic potash or soda. This treatment removes the wool and a small percentage possibly 5 per cent. of the cotton. Rinse, dry and and weigh the residue, add 5 per cent. and the result is the weight of the cotton in the original sample. It is well to enclose the sample in a small sack of cheese-cloth while boiling it in order to prevent loss of the cotton.—"Dalgety's Wool Review."

Hand Bleach.

A good hand whitener is fifteen drops of carbolic acid, thirty drops of acetic acid, one ounce of gelatine, eight ounces of water ; dissolve the gelatine in hot water, and when moderately cool add the other ingredients. Apply to the hands after washing and before drying them. It will keep the hands soft and clean.

Neatly Dressed.

There is an exquisite charm about a neatly-dressed woman. She does not wear her hair loose, as if it is just about to fall on her shoulders. Her gloves are not ripped at the seams, nor are any buttons missing from her boots. Her veil does not reveal a hole over her chin, nor does the binding of her skirt show ragged in places. Not many women show their tidiness in these details, but the well-groomed woman considers that neglect in those little things is full of shame to womankind. Note the well-dressed tailor-built woman. Her cloth gown fits her without a crease, and there is neither speck nor spot on it. Her linen collar and cuffs are snowy white, and remain properly fixed in their places. Her gloves do not wrinkle but button smoothly over her wrists, her shoes are dainty and pointed and polished. Her bonnet or hat is pinned on straight, and her hair is neatness itself. She is the picture of delicate finish and wholesome order. Would that we could come across her somewhat oftener.

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Always use cold water for washing glasses. The cold water not only helps to produce a higher polish than warm water does, but it is a safeguard against unnecessary breakages,

Cooking Meat.

Doubtless all are familiar with the fact that a piece of roasted or fried meat weighs less than it did before cooking, but know little of the nature of the losses thus resulting. Prof. H. S. Grindley, of the University of Illinois, has recently reported the results of a considerable number of experiments on the character and extent of the losses sustained when meat is cooked in different ways. Most of the tests were conducted with beef, although a few were made with mutton. The meat was either pan broiled—that is, fried in a medium hot frying pan without the addition of fat or it was boiled or stewed—that is, cooked in hot water—the length of time the meat was cooked and the temperature of the water varying in different tests. In some cases the meat was plunged at once into boiling water; in others the water was cold at the start. The pan-broiled meat was weighed before and after cooking, the material which adhered to the frying pan being included with the cooked meat. Boiled and stewed meat and broth which contained the material extracted while cooking were also weighed and analyzed. In every case the composition of the cooked meat was compared with that of raw meat of a similar cut. Among the conclusions reached as a result of these experiments are the following: The chief loss in weight during the cooking of beef, and doubtless of other meats also, is due to the driving off of water. When beef is pan broiled there appears to be no great loss of nutritive material, particularly if the material adhering to the pan is utilized in the preparation of gravy. When beef is cooked in water from 3 to 20 per cent. of the total substance is extracted and found in the broth. The material thus removed from the meat is not an actual loss if the broth is utilized for soup or in other ways.

Beef which has been used for the preparation of beef tea or broth has on an average lost comparatively little nutritive material, though much of the flavoring material has been removed. The amount of fat found in the broth varies directly with the amount originally present in the meat, i.e., the fatter the meat the greater the quantity in the broth. The amount of water lost during cooking varies inversely as the fatness of the meat, i.e., the fatter the meat the less the shrinkage due to loss of water during cooking. In cooking in water the loss of constituents is inversely proportional to the size of the piece of meat. In other words, the smaller the piece the greater the percentage of loss. The loss appears to depend also upon the length of time cooking is continued.

When pieces of meat weighing from 1½ to 5 pounds are cooked in water having a temperature of 175 to 185 degrees F. there appears to be little difference in the amount of material found in the broth, whether the meat was placed in cold water or in hot water at the start. The broths obtained when meat is cooked in water do not contain a high percentage of nutritive material, but they do contain much of the flavoring material ordinarily present in the meat.

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Home Recipes.

— Naples Soup. —

Place in a saucepan three pints of milk, with a blade of mace, the yellow rind of half a good lemon, and a small onion. Bring the soup to the boil, simmer all for a few moments, and strain. Mix a tablespoonful of rice flour with a very little milk till smooth, and add to the flavoured milk, stir whilst all boil up together. Beat up two fresh eggs, with a little pepper and salt, and into them pour gradually a pint of the soup, stirring all the time; return to the saucepan, and make very hot, but not boiling. Have some well-boiled macaroni ready, cut it into quarter of an inch lengths, and add to the soup. Scatter a little chopped parsley over, and serve.

— Lobster Curry. —

This may be made from the tinned fish, and will taste excellent, and be quite equal to a fresh fish if a good brand be selected. First, fry an onion lightly (so that it will not brown) in butter, add a tablespoonful of flour and a cupful of hot milk, stir till all is well mixed, and, as far as possible, remove the onion: squeeze the juice of half a lemon into the sauce, add a teaspoonful of curry powder, and see that the sauce is thoroughly smooth, if not, it should be strained into a clean pan. Divide the lobster into small pieces, and warm it in the oven before adding to the curry sauce. Cover the pan, and stand at the side of the stove for twenty minutes. Serve in an entree dish, with a border of well-boiled rice. Chutney should be added as a garnish, or be handed with this dish.

— Veal Souffle. —

Place a full tablespoonful of butter in a saucepan, and, when melted, stir in a tablespoonful of flour, season all with cayenne pepper, grated nutmeg, a teaspoonful of anchovy sauce, and salt. Into this pour half a pint of boiling milk in which an onion has been cooked; stir the sauce till thoroughly smooth, and add to it half a pint of chopped cooked veal, and heat all together. Draw the pan to the side of the fire, and add the beaten yolks of two eggs. When the mixture is cooled sufficiently, add the beaten whites of the eggs, shape into a mould on a baking dish (fit to serve it in) place mushrooms or half tomatoes round, and bake in a good hot oven for twenty minutes. A nice brown gravy or white sauce may accompany this dish.

— Grilled Ham and French Beans. —

Trim and cut two pounds of French beans, and boil them in salted water till tender. When the beans are soft drain on a sieve, put them back in a saucepan with one ounce of butter, pepper and salt, and place over the fire till boiling. Trim and broil some thin slices of lean ham, place the beans in a flat mound on a hot dish, garnish with the rashers of ham and serve at once.

— Scotch Eggs. —

Boil the eggs hard and cut them in half, take out the yolk and rub it through a sieve into a basin. Add to it two tablespoonfuls of thick white sauce, two tablespoonfuls of finely chopped ham, and a little chopped parsley; season to taste with pepper and salt. Fill the egg with this mixture full enough that it takes the shape of a whole egg. Egg and bread crumb them, and fry them in hot fat a good brown. Serve on a napkin with dried or fresh parsley.

— Apple Charlotte. —

Grease a rather shallow pie-dish and scatter it thickly with fresh breadcrumbs. Boil some apples to a pulp, flavour with cloves, and beat smooth with a spoon. When cooked, remove the cloves, add sugar to taste, and pour the pulp into the pie-dish. Cover with a thick layer of breadcrumbs, put little pieces of butter on the top, and bake for an hour. Serve in the dish, which should be garnished with a paper frill.

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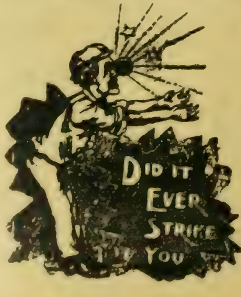
Don't criticise first and inquire after. That wound is hard to heal.



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SATISFACTION GUARANTEED.

A Bargain.

A subscriber informs us that he has a number of Black Leghorns and Rouen Ducks which he wants to get rid of. Though we do not know the birds, we know the man, and feel quite sure that the opportunity of getting a nice little bunch of well bred stock is one which should not be overlooked by anyone on the look out for a bargain. This is, we believe, the sort of opportunity which, like Christmas, comes but once a year. We shall be pleased to send on any correspondence addressed "Bargain," this office.

◆

The Responsibilities of Private Trustees.

In the past we have on several occasions pointed out the wisdom of entrusting the management of estates to public companies, such as Elder's Trustee and Executor Company (particulars of which will be found elsewhere in this paper), instead of relying on individual trustees. The truth of this contention, it is gratifying to note, is being more widely recognised with each succeeding year, and Trustee Companies are coming into general favour the world over. What we have said has been principally in regard to the interests of estates, and of those who are expected to benefit from the same, but, on the other hand, if individual trustees were only cognisant with the heavy responsibilities entailed on them in virtue of their office, few, we think, would care to take such onerous positions. Indeed, after reading Underhill on "Trusts and Trustees" it makes one wonder not only how a friend can ask a friend to place himself in the invidious position of Trustee, but why a friend, for friendship's sake should allow himself to be involved in such serious business responsibilities. The publication referred to is a standard work on the subject and well worth the careful study of all who take upon themselves the duties and responsibilities of trusteeship. From quite a number of points not generally understood by the majority of trustees we cull the following :—

Where a settlor gives his trustees apparently unlimited discretion by providing that they may "place the trust funds at interest at their discretion" it may be held that the discretion given in these words is not as wide as it appears to be, but that the trustees must confine their investments to a selection of such securities as are authorized by law.

If, on the other hand, a will or settlement directs the investment of trust funds in particular securities the trustees are precluded from other investments sanctioned by the law.

Trustees are responsible for trust property which is stolen from them unless they can show that all proper precautions for the safe custody of that property were taken. The loss of the property by theft might be construed as presumptive evidence that proper precautions were not taken.

In a future issue we purpose making further extracts from this interesting work, but those already quoted should be sufficient to induce persons who may be asked to fill the office of private trustee to well weigh the responsibilities of the position.

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Dalgety's Annual Review.

The thirteenth issue of the "Annual Wool Review" published by Dalgety and Company, Ltd., just to hand, fully maintains the high standard of excellence which has characterised the preceding publications of the series. Compiled primarily as a statistical record of results in all departments of the wood trade, the figures quoted appear to be very complete in detail and comprehensive in scope, consequently of great value to all who grow and handle wool. In addition many topics of importance to producers are discussed, the range of subjects covering various phases in the handling of wool from the sheeps back to the mill. The publication is one which should certainly be in the hands of every woolman, if only from a business point of view. Not only so, but the story of the progress of Australasias' greatest industry is so graphically told in the facts and figures detailed therein that the causual reader as well as the student of the economic development of the Commonwealth and New Zealand will find in it matter of absorbing interest.

WANTED TO SELL.

DORKINGS.—Silver and Coloured and Indian Game low set up-to-date strain. Columbian Wyandottes. Eggs 10/- for 15. Birds from 10/6 each, according to quality. — J. J. GABB, Somerton Prize Poultry Yards, Glenelg, S.A. 8-11.

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FLOWERS—Seedling Cactus Dahlias, flower this season, 2/- doz., posted. New Mammoth Lady Lennox Cosmos, New Red Sunflower, 2 packets 1/-. G. FRENCH, 430 Bourke Street, Melbourne, Victoria.

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Editorial Notices.

TO ADVERTISERS.—Alteration of advertisements should be in our hands not later than the 15th of the month.

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ADDRESS—85, Currie St., Adelaide. Telephone, 1234.

AGENTS.—Messrs. ATKINSON & CO. and MESSRS. GORDON & GOTCH, Ltd.

The Editor will be pleased to receive correspondence and answer questions. These replies will, for the most part, be sent by mail, unless received just prior to date of publication.

PUBLISHING DATE.—On the 25th of each month preceding title date.

DISCONTINUANCES.—Responsible subscribers will continue to receive this journal until we are notified by letter to discontinue, when all arrears must be paid.

The National (English) Sweet Pea Society's Show.

Mr. J. J. Gabb, who is at present in England, has sent us the following interesting note of the above show which was held on July 11 and following days at the Royal Horticultural Hall, Westminster. Mr. Gabb writes:—The committee of management and the secretary (Mr. C. H. Curtis) are certainly to be congratulated on the splendid success of this show which, I am told, is the finest display of Sweet Peas ever seen, at all events, in England. There are forty-four classes, one hundred and fifty exhibitors, and two thousand five hundred bunches of flowers sent in by the leading professional growers. The centre of the hall is occupied by the various competitive classes whilst the space around the walls is taken up by non-competitive exhibits, which make a brave display. The foremost names in the English Horticultural world are well represented. Messrs. Sutton, Dobbie, Colman, Carter, Page, Sydenham, Cantley, King, Bolton, Jones, Falkner, and others all showing very fine stands. Principal honours for novelties go to Dobbie, of Edinburgh, who is awarded one first class certificate and three awards of merit. The novelties are No. 1, May Campbell, cream ground marbled purple. This variety will, I think, be found very useful for table decoration, being quiet in tone, yet possessing some warmth of colour. No. 2, Mauve Queen, a new shade of mauve, very fine. No. 3, Thomas Stevenson, a bright orange scarlet. No. 4, Red Star, considered to be the best scarlet yet raised. Mr. Robert Holmes also wins a first class certificate for a novelty. Mr. S. Davies and Messrs. Gilbert & Son, awards of merit in the same section. Messrs. Bolton, Dobbie, Sydenham and Carter take gold medals, and silver gilt medals are awarded to Messrs. Sutton, Deals, Bide, and Box. The Sutton Cup for twenty one bunches distinct is won by Sir Randolf Baker, and the Eckford Memorial Cup by Mr. E. G. Mocatta. The Beadmore Challenge Plate is awarded to Mr. E. Cawdy and Mr. R. P. Brook obtains the E. W. King Challenge Cup. Another Challenge Cup goes to Mr. James Hall, an Irish grower from Tyrone, his blooms being very fine indeed. The Horace Wright Cup goes to Mr. C. Jaggs, and Mr. Lewis, of Strathmore wins the Walter Voss Cup. The newest thing in the show is perhaps a bowl of double sweet peas, shown by Mr. Stark, of Great Ryburg, a beautiful exhibit of flaming Maggie Stark's. The decorated tables are very elaborate and therefore very crowded. I have, I think, seen quite as good exhibits at our Adelaide shows.

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The Hoe in the Garden.

Humble though it may be, it is very doubtful whether any tool, excepting the spade, is as useful in the garden as a good steel hoe, at least one being absolutely necessary even in the smallest garden. It is equally doubtful whether many wielders of this tool get the utmost amount of good that it is possible to obtain by a proper and intelligent system of using it. Hoes, like many other things, vary considerably in shape and size, and in most gardens, several sorts will be useful, and where this is the case the Dutch hoe and the swan-necked draw hoe must be included. The former is a most valuable tool for destroying small weeds in beds and borders without disturbing the surface to any great extent, and the latter is most useful for heavier work.

But it is the benefits to be derived by the constant use of the hoe in the garden during the greater part of the year that we are most concerned with, the one that stands out from among the many others is the preserving of moisture in the soil. There is no gainsaying the fact that where soil is frequently hoed during hot weather the moisture is retained therein to a much greater extent than it is in soil that is left untouched, simply because the natural evaporation from the soil is checked and moisture preserved by a layer or mulch of fine soil. Were the hoe used more frequently and the hose or water-can less better results in many instances would be obtained than have been hitherto. This is a point that many otherwise good gardeners are apt to overlook. Then, again, air is admitted freely to the soil, and as pure air is of the greatest benefit to the roots of plants, the good done in this direction will be very great indeed. Grubs, too, of many kinds are exposed and placed at the mercy of birds that are ever on the look out for them. Cultivators, generally, are too often apt to regard the hoe as a tool for destroying weeds only, and, although this was probably its primary mission, we should not be backward in availing ourselves of its services for other purposes.

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Sweet Peas.

Attend to their staking, manuring, and watering. Where it is possible remove the seed pods as they form, as this prolongs the time of bloom. When gathering the blooms care should be exercised, and the flowers cut—not torn off.

WANTED TO SELL.

FLOWER SEEDS, 12 lovely packets, including New Giant Spider flower, Cactus Dahlia, Carnation, Petunia, Giant Double Zinnia, Pentstemon, etc., 1/6 12 packets. G. FRENCH, 430 Bourke St., Melbourne, Victoria.

The Rose Garden.

— Artificial Manures for Roses. —

An ideal stimulant for Roses, writes a correspondent to the Garden, is phosphate of potash and nitrate of potash, half an ounce of each to one gallon of water, supplied about once in ten days, but discontinued when the buds begin to show colour. This is a good stimulant, but be careful it does not touch the foliage. Nitrate of soda is a powerful stimulant and very quick acting. Use half an ounce to two gallons of water. This would be most effectual just to finish off the buds, applying when they are about one-third grown. Dried blood I have found an excellent preparation when applied at the rate of 1oz. to a square yard, repeated about once a fortnight and watered in if no rain falls. Fish guano, a teaspoonful per plant once in fourteen days and watered in, is good; old established plants could have double the quantity.

Sulphate of ammonia and nitrate of soda, a quarter of an ounce of each to two gallons of water. Give this quantity to each tree or bush once in ten days. N planted Roses must not be watered with this, and I only advise it for those growing in a rather light soil. Superphosphate of lime, 1½oz. to a gallon of water, applied twice a week. Guano, 1oz. to a gallon of water, applied twice a week until the flower buds show colour. A good reliable manure is composed as follows: Superphosphate of lime, twelve parts; nitrate of potash, ten parts; sulphate of magnesia, two parts; sulphate of iron, one part; and sulphate of lime, eight parts. Apply a quarter of a pound to the square yard now and a lighter dressing later in the spring. I think, where artificial manures must of necessity be resorted to, that it would be advisable to transplant the Roses at intervals of, say, three years, giving them some new soil about their roots, and, of course, well digging the staple soil. It must be distinctly understood that only one of the above-mentioned manures should be applied at once, except where two or more are given in conjunction.

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The Scentless and the Scented Rose.

In the instructive and useful "Rose Annual" a publication of the English National Rose Society, an article is published on "The Scentless and the Scented Rose," which it is a pleasure to reproduce: It is strange that in the many Rose catalogues issued, little or no mention is made of the most delightful of all attributes of the Rose—fragrance. The varied hues of the Queen of Flowers are described in most poetic language, but "the potent witchery of smell," as Whitter puts it, is treated as superfluous. Alas! there are many beautiful Roses which lack this "subtle power of perfume" to make them perfect. The most striking example is that grand Rose Frau Karl Druschki, which, beautiful as a masterpiece in snow white marble, yet possessing no fragrance, is like beauty without soul.

Nearly everyone has a slightly different appreciation of Rose perfume. Some have the power of finding odours in the more delicately scented Teas resembling various fruits—Raspberry, Apricot and Peach for instance—but it is in the Hybrids and Hybrid Teas that the true Rose scent is so markedly found; and with what impatience each year the lover of Roses awaits "the first to cast its sweets upon the summer." Of the Roses which have little or no scent I may include, in addition to Frau Karl Druschki, Baroness Rothschild, Merveille de Lyon, Her Majesty, Mildred Grant, Mrs. Theodore Roosevelt, Crimson Rambler, Mrs. Cutbush and Maman Levavasseur.

To name the most highly scented of all Roses is no easy matter, but undoubtedly the following Hybrid Perpetuals stand in a class by themselves: Etienne Levet, Marie Baumann, Senateur Vaisse and Commandant Felix Faure. Then follow Chas. Lefebvre, General Jacqueminot, Ben Cant, Dupuy Jamain, Captain Hayward, Mme. Gabriel Luizet, A. K. Williams, Louis van Houtte, Horace Vernet, Prince Camille de Rohan, Victor Hugo, Ulrich Brunner, Alfred Colomb, Hugh Dickson, Helen Keller, S. M. Rodocanachi and Mrs. John Laing.

Among the Hybrid Teas I would select: Mrs. David Jardine, Mamie, Marquise Litta, Augustine Guinoisseau, Mme. Abel Chatenay, Cherry Ripe, Cheshunt Hybrid, La France, La France '89, Daisy, Gladys Harkness, Johanna Sebus, Richmond, General McArthur, Mme. Jules Grolez, Souv. de Zayas, Dr. O'Donel Browne, Mrs. Stewart Clark, Avoca, Gustave Grunerwald, Lyon Rose and Lady Helen Vincent. Then there are two Roses quite different from the above but quite delicious in their way: Zephirine Drouhin (Hybrid Bourbon) and Princess Bonnie (Hybrid Tea), to which may be aded the best of the Scotch Roses, Stanwell Perpetual, as fragrant as it is beautiful.

For the Tea scents, first by a long way is Marechal Niel; then Catherine Mermet and its two sports, Bridesmaid and Muriel Grahame, Socrates, Mrs. Edward Mawley, Sunset, E. V. Hermanos, Meta and Molly Sharman Crawford.

Finally I must mention the following Roses, each of which has a fragrance somewhat elusive, but quite typical in each case: La Tosca, La Marque, Goubalt, Camoens, Mme. Alfred Carriere, Souvenir de la Malmaison and Pink Roamer.

◆

A Good Climber.

— Solanum Jasminoides. —

Few white flowered climbers make a better display than this beautiful Solanum. It is an evergreen, very hardy and a quick grower. It makes a very good wall covering if reasonable care is given to training it till the alloted space has been filled. Afterwards as it flowers on new wood it should be well cut back in early spring. An ordinary garden soil will suit it but in heavy clay it would be well to mix in some sand before planting.

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I have again to offer the finest grown lot of Standards and Dwarf Roses in this State.

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Send for Catalogue 1911.

Methods of Depollinating Flowers.

Bulletin No. 167 of the Bureau of Plant Industry of the United States Department of Agriculture has been issued under the title New Methods of Plant Breeding. The publication does not, however, describe strictly any new methods that might be employed for the breeding of plants, but rather suggests useful practical variations in connection with those that are in common employment.

The chief part of the information contained in the Bulletin has more particular reference to methods for facilitating the depollinating of flowers that are to be used for crossing. The work which is dealt with was undertaken as a result of the difficulty that was found in depollinating the flowers of lettuce, when it was intended to cross different varieties. The manipulation of these flowers is particularly difficult, on account of the smallness of the flower heads, and the fragile nature of the florets. The work continued to present difficulties, until it came to be suggested that a jet of water might be used for removing the pollen. The first application of this means was by fitting a piece of soft rubber tubing of small diameter to the end of a garden hose, turning the water on to such a degree that it just trickled from the tubing, and squeezing the end of the latter so as to produce a very small jet of water. When this jet was directed on to the lettuce flowers, the pollen was removed completely after a few seconds. The depollinated florets were then dried by touching them with the edges of small pieces of blotting paper, and then pollinated with the required pollen.

It was soon found that the method of depollinating, using water from a hose, was somewhat clumsy, and uncertain in its results; there was the additional objection that a hose was not always available for the purpose. A fairly good substitute for the arrangement was found in a large rubber bulb, into the mouthpiece of which a suitable piece of bamboo, or something similar, was fitted, for the purpose of regulating the size of the jet of water produced when the bulb is squeezed. An arrangement of this kind is suitable for large flowers, such as those of the Compositae and Leguminosae.

For every small and fragile flowers, however, the jet of water formed in this way is too large; but it may be obtained of a suitable size from bulbs of the kind sold for the use of dentists. Where many flowers are being treated, several such bulbs are used, each being placed, compressed, in a bowl of water, after it has been employed so that by the time it is required again, it has expanded and filled itself. Other useful bulbs are similar to those used on photographic cameras; these can be adapted for the work by fitting them with jets made from drawn out glass tubing.

Information is given regarding the kinds of forceps that are most suited to the needs of the plant breeder. The suggestion is made that those in common use would be more suited to the work required of them if they were supplied with a flattened pin attached to the handle and pointing away from the ends of the forceps. The special advantage of such an attachment is that it makes it unnecessary for the operator to lay down one tool and take up another while he is performing a piece of work that requires his undivided attention. An arrangement of the kind can be easily obtained by tying a needle to the handle of an ordinary pair of forceps.

Detailed particulars are presented of the way in which depollination by water may be employed in the case of alfalfa. These are followed by a description of a means by which these flowers, as well as others, may be depollinated by using compressed air. In this method, after the flower has been prepared for the removal of the pollen, the stamens are subjected to a current of air coming from a a small cylinder at a pressure of 20 lbs. It has been found convenient for the nozzle of the air tube to be held about ½-inch from the stamens, by an assistant. Satisfactory cross-pollination has been effected with the aid of this means, but the success was not as great as when a jet of water was used in depollination.—"Agricultural News."

Violets.

Violets, as almost everybody knows, may be propagated by division of the roots; also from runners or seeds, the two former methods being those generally employed. By dividing the roots of Violet plants their vigour is increased, which can be said of most perennials; hence the best results are obtained when the plants are divided each year after flowering. Runners can also be used by being planted out in early autumn, and by this method a young and vigorous stock can always be maintained, which will make fine plants for winter flowering. In planting out Violet crowns, or runners, allow one foot between the rows and nine inches between each plant; the large single varieties can be allowed a little more room. After planting water well, when they will require little further attention beyond being kept free from weeds, and pinching off all runners as soon as they appear. In about two months' time the plants will be well established, and as the weather gets hot and dry they should be syringed every evening and thoroughly watered as required. A mulching of light manure, or compost, can be applied between the plants to advantage or an occasional application of liquid manure.

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Ferns.

The reason why so many house ferns do not thrive is due to allowing water to stand continuously in the saucers, and to the dry atmosphere of the room. While a moist atmosphere is essential, yet the continuous syringing of the plants causes foliage injury and is not advisable, nor is it good to keep them always standing in water. The soil and drainage should be so arranged that any water given shall be able to pass through freely. The watering should be done with a watering can and the same principle applies to ferns grown outside. An occasional washing is, of course, necessary, but not continuous sprayings.

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A GENTLE HINT.

Guest: "Well, good-bye, old chap, and you've really got a nice place here."

Host: "Yes, but it's rather bare just now. I hope the trees will have grown a good bit before you come here again, old man!"

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(Opposite Foy & Gibsons).
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Open Border Notes for September.

The dry spell and the unusual heat we have been having of late, has been rather hard on the amateur gardener, whose watering operations have had to be begun considerably earlier than usual, on the other hand early sowings where properly attended to have come along finely, still we shall all be glad of the good soaking downpour, which let us hope, will have arrived before these notes are in print.

All gardens should by now be ready for their spring and summer dressing, that is, all the space available should have been dug and manured.

Half-hardy annuals sown in frames or under shelter of sorts, should be put out as soon as ready, choosing a cool and cloudy day rather than one which is warm and dry.

Make further sowings of all this class either in boxes, seed beds, or where they are to flower, either of the first two methods are certainly best with all sorts which transplant easily, there are only a few sorts which do not.

Roses may be planted but the sooner they are in the better. Do not forget to cut any big tops back, this is more important when the weather is warm than during the cooler months.

A good bed of canna is a first class investment. They will stand and enjoy any reasonable quantity of water and manure. They make the finest show if put in without much delay. They are one of the kindly things which revel in the hottest position in the garden.

Put in evergreen ornamentals and hedge plants, give them a fair watering as soon as planted and see that they at least do not suffer for want of it till they are thoroughly established. Do not, however, flood the bed till active root growth is taking place.

Old stools of chrysanthemums and similar plants may still be taken up, divided and replanted. Cuttings of fairly hardened wood can also be put in.

Where evergreen trees are to be transplanted care should be taken to keep as large a ball of earth as possible around the roots. It is better to wait for cool showery weather than to rush the work when the sun and the north east wind are taking an active part in things.

The same principle applies to palms which will do well if planted out now. In palms it is certainly worth while paying the extra money for fair sized plants. They appear to stand the change of position as well as the small pot stuff and they of course make a much better show in a much shorter time. The Washingtonias (cotton palms) are probably the most popular. Other good ones which do well undcer any ordinary conditions are the Phoenix palms (canariensis, reclinta, and dactylifera) Corypha Australis, Cycas revoluta, and cocos plumosa.

Aphis on the roses is becoming plentiful. Gishurst's compound is about the surest and most easily applied remedy.

Time spent in going round the garden and pinching out the growing points of shoots making too much progress, will not be wasted. Stocky well branched plants are always to be preferred to lanky straggly stuff showing a lot of bare stem.

We have been kept rather short of rain this year and this shortage may continue, so it will be wise to make the most of what has or may fall by mulching the ground. In any case the days will now be getting longer and warmer, and in consequence the soil will begin losing, by evaporation, a great deal of the moisture. It should be the aim of the gardener to prevent this as much as possible, both for his own sake (for it saves him work in artificial watering) and for the sake of his plants. One of the best ways of doing this is by placing on the beds what is called a "mulch," or a covering of some foreign material, such as long manure, straw, seaweed, or sand.

The best material to use is long manure; that is, stable manure containing a certain amount of straw or seaweed bedding, but there is a dislike to it because of its untidy appearance. Clean short manure does not possess this defect, but has a tendency to set close after being on the bed some weeks, and in consequence requires an occasional stirring with the fork hoe.

In small gardens it will be possible to cover the whole surface of the beds, but in gardens of large area it may be found impracticable, and in that case the mulch should be placed round each separate shrub and plant, the area covered being governed by the size of the plants.

As to the depth that it should be put on. Do not spread it too thickly, two or three inches will be sufficient, although round fair sized shrubs a depth of twice that will be of material benefit to the plant. When autumn comes round again, and the usefulness of the mulch is past, it can be dug in or raked off and placed on the compost heap.

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Lawns.

Either Buffalo or Couch grass lawns should be receiving their spring treatment. All weeds should be carefully taken out, roots and all, with a chisel or strong knife. A good deal of care taken now will pay. Then run the cutter over, and rake and sweep the surface clean. Then sow 2lb. superphosphate and 1lb. sulphate of ammonia for each rod of lawn, i.e., for a lawn 16½ft. square. In addition to this, a good dressing of fine rotted old manure, leaf mould, black river silt, old rotted street sweepings, or such material should be carefully and evenly spread over the surface and raked or swept in. The dressing should be dry enough and fine enough to crumble, so that it will sweep and wash amongst the grass. If this be done carefully and well the foundation of a perfect lawn will be made. Growth will commence this month, and should be kept cut short. The planting of new lawns with these grasses may be com-

Packing of Plants

is important to country people. Read these extracts :—

The consignment of plants, per s.s. "Ophir" arrived in good order and condition, after their long journey.—B. & Co., St. Albans, England.

Trees reached us safely, the bundle being well packed.—F. J. N., South Africa.

The nine cases of plants arrived perfect, not one pot broken.—M. & H., Broken Hill.

W. J. Smith,

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menced now. If the land requires enriching, a dressing of bonedust may be mixed with the top spit prior to planting. There is considerable difference of opinion as to which makes the best lawn, and as fancy plays some part and local conditions a good deal, we cannot hope to decide the point. Couch grass is, however, best for planting any place that will be trodden upon a great deal, while for a nice, ornamental lawn or border which can be prevented from encroaching upon the flower beds, the Buffalo grass is far superior. It is also easier to mow.

There need be no particular hurry to get the grass in. Indeed, we should prefer to spend the time between this and, say, the middle of October, in thoroughly preparing the ground, if this important matter has not been done, than plant on the rough and ready plan. At the time of digging turn in a quantity of old manure; the more ancient it is the better. If this is spread over the surface three inches deep it will not be too much, as it must be remembered that this is the only chance one has of putting it there; afterwards all manure must be dribbled in from the top. After the first turn over, let it rest for a fortnight or so, when it can be turned over again, digging this time a little more carefully, pulverising all lumps and clods, and continuing the process of levelling, which must be completed with a rake afterwards. If you are not too tired a third digging before planting will be beneficial, for every time it is done a large quantity of weeds and weed seeds are killed, and thus much labor will afterwards be saved. Attempt no planting until you are satisfied that it is perfectly level. It is worth while using a spirit level and a piece of straight timber. The cuttings of Buffalo grass should be about 4 or 5 in. long, and about three-quarters of this length must be inserted in the soil, using a small stick or dibble for the purpose. While planting avoid placing the foot on the ground. This difficulty may be overcome by using two 5-ft. stringy-bark palings, or any similar flat pieces of board. Two are needed, so that you may change your position without treading on your lawn. The cuttings should be planted about 4in. apart, planted irregularly and not in rows. When finished give a thorough watering and keep it moist, at least till the cuttings have all struck and are making growth, this will be very rapid when the weather warms up.

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As to Making Wills.

WHOM SHALL I APPOINT MY EXECUTOR?

A difficulty which at any time is likely to present itself to the owner of property is that of securing a person in whom sufficient confidence and trust can be placed to allow of his being entrusted with the control of ones private affairs. At no time does this difficulty present itself with more force than when, in making your will, you have to appoint executors and trustees to act for you. One may have friends whose honour and integrity can be fully relied on, but who are wanting in business experience, or it is possible that the friend selected may die soon after the testator, and the administration of the estate may be placed in the hands of someone in whom in his lifetime he had no confidence whatever, and may sooner or later result in the assets of his estate being misapplied. To avoid this, and to ensure proper administration, it is surely better to avail yourself of the services of a Trustee Company, as by doing so all anxiety concerning the management of your estate in the future is avoided. For over thirty years the Executor Trustee and Agency Company of South Australia, Limited, has been in existence in this State, and the high reputation it holds among similar companies throughout Australasia, and the large number of estates under its control are sufficient guarantees as to its standing in the commercial world. To give some slight idea as to the extent of the business done the amount at credit of the various estates, etc., under its control on September 30 last was £2,309,313. It must be evident that a Company whose management is entrusted to a Board of Directors of acknowledged skill and experience, and a staff of officers thoroughly conversant in every detail with the duties and responsibilities of Executors and Trustees, is in a better position to look after the affairs of an Estate than any private person or persons are likely to be. For the added convenience of clients the basement of the large offices at 22 Grenfell Street has been fitted up as a Safe Deposit, in which for a small charge practically all classes of valuables can be stored. It is fitted with safes of different sizes (let at yearly rentals from £2 2/-) suitable for the custody, under owner's sole control, of deeds, bonds, scrip, jewellery, cash, and documents of all kinds. No expense has been spared to render the Safe Deposit, Burglar and Fireproof.

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Mina Lobata.

This is an exceedingly pretty annual creeper, the seed of which should be put in now in warm places, and from now on in later localities. Raise the seed in pots and plant out when the plant is four or five inches high. It commences to bloom early in the autumn, and will continue in flower for many weeks, presenting during that time a brilliant and charming effect. It attains a height of eight to ten feet.

Two Thousand Years Old.

Examination of one of the giant trees of California, after being felled, revealed a most instructive history of the forest fires which had swept the region where for more than 2,000 years the trees had existed. The effects of fires occurring centuries ago are registered in the trunks of trees, and the record is completely concealed by subsequent healthy growth. The tree had an enormous burn on one side, 30ft. in height and occupying 18ft. of its circumference. This burn was due to a fire which occurred in 1797, and the tree had therefore occupied more than a century in its efforts to repair this injury, its method being in growth of new tissues from the margin of the great black wound. The tree began its existence in about 271 B.C., and in 245 A.D. occurred a burning on the trunk 3ft. wide. This fire therefore took place in its 517th year. A hundred and five years were occupied in covering this wound with new tissues. For 1,196 years no further injuries were registered. In 1141 A.D., at 1,172 years of age, the tree was burned a second time in two long groves. Each had its own system of repair. In 1580 A.D., at 1,551 years of age, occurred another fire, causing a burn on the trunk 2ft. wide, which took 56 years to cover with new tissues. Two hundred and seventeen years of growth followed the burn. In 1797 A.D. occurred the tremendous fire which burned the great scar of 18ft. wide. In the hundred odd years which have since gone by, the tree had been repairing the burn, and had reduced the exposed area by about 4ft. of width.

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Antirrhiniums.

An English gardener, writing of this popular flower, says: — I should like to call to my readers' attention, a plant that I may truthfully say should find a place in every garden. It is not a novelty, far from it, it is numbered among the good old-fashioned plants. Yet in a sense they are novelties in that we can now obtain varieties and strains that are of quite modern introduction. It is more familiarly called the Snapdragon, and to go back further we find the real old-world name, the "Calves' Snout." It is not enough to have growing in our gardens strains that have been there year after year, and simply go on reproducing themselves. These old strains lack the clear, clean, and brilliant colouring o our up-to-date strains. Yet I can tell of gardens in which dull purples, and majentas still survive, when there might be a grand display of plants of much more vivid colouring. It is a grand plant for a dry, sunny position and a soil that tends rather to poorness How much better for a position such as this that I describe, to get a radiantly glowing effect from easily-reared simple plants such as Antirrhinums than to make the vain endeavour to achieve a fin display from choicer subjects which, however, demand a goo soil and a better position.

Rose Enemies.

Destructive leaf-rolling grubs an caterpillars are generally the firs pests to attack the Rose in th spring. They will be found curle up in the young foliage, and mus be sought for every few days an crushed between the finger an thumb, or much damage will b done. This is not a pleasant occupation, but, unfortunately, ther is no other remedy, except it be t pick off the affected leaves an afterwards burn them or thro them into a strong solution o salt and water.

—The Rose Aphis, or Green Fly.–

In some seasons these tiny creatures are very numerous an troublesome, and if not frequentl destroyed increase very rapidly Most exhibitors keep green fly under entirely by the skilful use o the thumb and finger. This onl shows how easily such pests ma be kept in check if attacked directly they make their appearance an never afterwards allowed to congregate in any great numbers. Occasional sharp syringing with clea water will be found in most case sufficient. Should this, howeve prove ineffectual, the followin well known remedy may be us instead: Take 2ozs. of Quassi chips and boil them in a gallon o

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water, adding a tablespoonful of soft soap before the mixture becomes cold; or one of the many insecticides on the market may be tried, keeping strictly to the directions supplied with the bottle

— Thrips. —

These tiny creatures often injure Rose blooms in hot and dry weather, especially those of the Teas, by giving the petals a bruised and brown appearance. Spraying or syringing with clean water is the best remedy to employ, even at the risk of spoiling some of the existing blooms.

— Red Spider. —

This is another serious enemy, and so small as not to be detected with the unaided eye. It generally attacks the lower sides of the leaves, and if not kept in check causes them to fall from the plant prematurely. The same remedy as for thrips is advisable.

— Mildew. —

Of all the insect and fungoid enemies of the Rose, this is, as a rule, the most troublesome to deal with. It appears as a white mould on the foliage, and if not promptly dealt with will quickly spread from one plant to another over the whole collection. It occurs at all seasons, but principally in autumn, when, if not checked, it will prevent the plants from flowering so freely as they otherwise would. Flowers of sulphur is a sure preventive, but each attack must be dealt with on its first appearance and the application repeated until a cure is effected. A very simple way of applying the sulphur is by shaking it lightly over the affected plants by means of a fine muslin bag on the first calm evening after the mildew is detected. Although only the upper surfaces of the leaves are dusted over, it will be found in practice that the action of the sun will vaporise the sulphur and cause the surrounding atmosphere to be impregnated with it. Syringing or spraying with the following liquid will also prove effectual, more especially if the under sides of the leaves can be wetted with it. To make this mixture, half an ounce of sulphide of potassium should be placed in a gallon of hot water, well stirring it until the sulphide is dissolved. When cold the liquid will be ready for use. Warm days, followed by cold nights, are the most frequent cause of this pest, also a close, muggy atmosphere.

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Scabiosa Caucasia.

The sweet-scented Scabious, commonly called Pincushion Flower or Morning Bride is familiar, but the beautiful perenial S. Caucasia is less known. As a border plant it ought to rank as one of the best. The flowers are large, the outer florets standing well away from the centre. In colour it is a most delightful shade of mauve. The stems are long and thus allow of admirable arrangement with ornamental grasses, reeds, etc., for house decoration. The plant in hardiness belongs to the iron-clad division and its cultivation is of the most simple provided the soil does not become water logged. It grows freely from seed or may be propagated by division of the root. It grows two or three feet high.

The Anemone.

Several species of this large and useful genus of plants have long been favourites, and they have consequently developed a considerable range in variety of colour, size, shape, etc. The oldest of these is the Poppy Anemone (A. coronaria), which, in Europe, has been a garden plant for the last three centuries. To do its best it requires a rich, deeply-dug soil. Some growers place a layer of cow dung a foot below the surface of the soil for the roots to lay hold of when the growth is vigorous. The bed should be raised a few inches above the ground level. The tubers, which are dry and shrivelled, should be planted in an open bed. Plant 2 inches deep and 9 inches apart. The bed should be kept clear of weeds, and a mulching of decomposed manure and leaf mould given in early spring. This assists to economise moisture in summer. Water freely in dry weather.

When the plants show signs of ripening by the foliage turning yellow; the tubers should then be lifted with some earth attaching to them, and stored away for planting another season. Seedlings can be raised from the best varieties, the seeds being sown as soon as ripe in a box of sandy loam and leaf mould, distributing them thinly over the surface, and just covering them with soil. The seeds germinate in about a month.

There are several named varieties, all of which are beautiful. They will thrive in any position. Anemone Japonica is a very fine variety which prefers moister conditions to the others and may remain undisturbed for years. St. Brigid Fulgeus, etc., are best lifted after flowering.

Japanese Maples.

The increased culture of Japanese plants during the last two decades has been most marked in England coincident indeed with the rise of Japan as a world power. And while Japan assimilates western methods, we, writes "Horticulture," in turn are indebted for many beautiful products of that fairy land of gardens and flowers. Iris Kempferi, lilies, bamboos, have each had exceptional patronage the last few years. The introduction of Japanese maples was an acquisition to western gardens; they may be said to epitomise a gifted people especially as embodiments of things artistic, rivaling many stove plants and the most delicate ferns in gracefulness of outline and beauty of foliage, and there are few gardens of note without specimens of these beautiful deciduous plants. When grouped they are very effective, but as isolated plants on a green lawn their beauty is sharply brought out.

Escallonias.

People who have gardens along the sea beach are often hard pushed to find something a little out of the common which yet will thrive under such conditions. The Escallonias, of which they are several varieties, should not be overlooked. Their evergreen foliage, deep glossy leaves, and handsome fuchsia-like flowers, and above all, their tolerance of sand and sea breezes give them a big claim for consideration. E. macrantha, a crimson flowered variety, is perhaps the most handsome, but the white and pink are both free flowering and beautiful. There is, or used to be, a magnificent hedge of these shrubs at Brighton, Vic., some years ago.

Lily of the Valley.

What gardener has not a warm corner in his heart for this lovely fragrant flower. Unfortunately they do not thrive too readily on the plains, but we know of more than one bed doing splendidly, proof that with care in the selection of the position there is no reason why they should not succeed. Leaf mould is chiefly its native soil. To form a bed, dig the soil two spits deep in a shady spot, protected from too much sun and the hot winds, incorporating with it a plentiful compost of leaf mould and decayed manure. If the soil is heavy, remove it, and replace it entirely with compost, but use more leaf mould. Plant the largest crowns in rows 6 in. apart, 2 in. between each crown, with the point of the crown about an inch below the surface. When an old-established bed has become too overcrowded, the plants should be taken up and separated, the largest crowns being planted, after remaking the bed as above. Plant the smallest crowns in a separate bed half the above distances apart. Do not disturb the roots more often than necessary. Spread a light top dressing over the bed before growth begins and water freely till the plants die off.

In some districts in England the flowers are known as "Our Lady's Tears," and as "May Lilies." In the woods of Germany this plant is very common, the flowers being gathered on Whit Monday, and when the day ends there is hardly a house without a large bouquet of them. In Devonshire there exists a superstition that the planter of lilies of the valley will have ill-luck; probably a foreign inspiration to prevent English growers from taking opportunity of their natural advantages, in order to maintain Continental exportation of the plants into Britain. When St. Dominic instituted the use of the rosary, the lady chapels consecrated to the Virgin were decorated with lilies of the valley, which are relics, says, Bishop Keble, "of Eden's bowers, as pure, as fragrant, and as fair." Their graceful, snow-white bells, surrounded by the rich green leaves, are not an unfit emblem of modest beauty, purity, and humility.

The Catalpa.

Those who know anything at all of hardy exotic trees do not need to be told that the Catalpa is a very fine ornamental tree, but there must be many to whom even such a useful tree as this is unknown, seeing how seldom one finds it planted. Those who know the American Catalpa will recognise in C. bignonioides or C. syringefolia as it is sometimes called one of our most handsome trees for garden planting, even when not in flower. There is, in fact, no finer object than an old Catalpa, as it is beautiful in leaf and highly attractive throughout harvest time, when, as a rule, it is covered with a profusion of loose white flower clusters, which are succeeded by a crop of long seed-pods, which look like attenuated French Beans, hence the name Indian Bean Tree. Apart from its peculiar growth, its large foliage, and showy flowers, the Catalpa is an important tree in garden landscapes on account of its colour, it being one of the lightest greens we have among big trees, and therefore a fine Catalpa always stands out prominently among others, both in colour and outline.

The rapid growth of this tree is a great point in its favour, from the seedling stage up to the flowering period and till the tree has reached its full height, which in this country may be from 20 to 40 ft. When at full height the tree develops laterally, and continues to form the broad, rounded head noticeable in a good specimen. Like other large leaved trees, the Catalpa needs a deep, free soil for rapid and luxuriant growth, and though it will sometimes thrive on poor soils and exposed dry spots it is never seen to such perfection as in a moist, deep rich alluvial soil. The Catalpa is peculiarly a tree for small gardens, because it never grows very large; it is, in fact, one of the few medium-sized trees that can be planted on a small lawn, and as a town tree it has few equals, being, like the Plane and the Fig, especially adapted for withstanding the tainted atmosphere of large cities.

Blue Roses.

Professor Gustave Michaud, Costa Rica State College, has an article in the "Scientific American" of 27th November, 1909, on a method of producing blue roses.

The roses, he says, are white with a delicate and beautiful network of blue veins. Such roses can be obtained in little more than one hour by placing the following solution, instead of water, in the vase in which the cut ends of the stalks are dipping:—

Water—100 cubic centilitres (35 ozs.); aniline methylene blue—2 grammes (30 4-5 grains Troy); potassium nitrate—2 grammes (30 4-5 grains Troy).

It appears that while some aniline dyes like red scarlet, used for cotton, readily rise into the vessels of the stalk, others, like aniline methyl green, will not, under any circumstances, reach the flowers.

Some common salts were added to the dyes, and one of them, potassium nitrate (saltpetre), was found to exert a powerful influence over the ascent of the dyes, which then rose rapidly and in considerable quantities. The experiment is curious, and should be repeated while using the blue liquid, the end of a few stalks being placed in some of the solution to which no saltpetre is added. Aniline methylene blue is not one of the dyes which readily ascend in plants, and it will be soon noticed that, while the flowers of the stalks dipping into the saltpetre and blue dye solution are covered with the blue network, nothing can still be detected on those whose stalks are allowed to dip in the same liqui without saltpetre.

Will some chemist or botanist suggest an explanation of the influence of saltpetre on the ascent of dyes in stalks and flowers? asks the Queensland Agricultural Journal, from which we copy the above par.

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Liquid Manure for Pot Plants.

Few people are aware of the great value of fertilisers applied in liquid form. Nearly every plant is benefited by its use at some period or other, and if applied prudently when the plants are most in need of some kind of stimulant the effect will be most observable, more especially in the case of plants in pots, where the space they occupy is circumscribed, and the properties of the soil soon become exhausted. How often we hear exclamations of surprise at the beautiful and healthy plants some growers produce, and the extremely small pots they are in. The secret is the careful and regular application of liquid food when the plants are growing and their pots are full of roots.

Many of the ills which plants are heir to are believed by those who are ill-informed to be the result directly or indirectly of the use of manures, when the real cause generally is the poverty of the soils in which they are expected to thrive.

It will be apparent to every amateur that weak and unhealthy plants are more subject to insect pests than are the healthy and vigorous. All plants do not require manure at the same period, so the amateur must use a certain amount of discretion. As the hot weather advances liquid food will be required. Notice the appearance of the various plants and apply it accordingly.

All liquid manure must be given in a weak state. The gardener must consider for what purpose he is using it, whether for foliage or flowers. If used to excess, the former will be at the expense of the latter. For plants like pelargoniums, zonales, cinerarias, petunias, calceolarias, and some other soft-wooded plants, once a week will be ample until such time as they show their bloom buds, then twice a week, easing off as the flowers expand, and ceasing altogether when the plants are going to rest. Never apply to newly-potted or dormant plants, especially in winter time. Many greenhouse plants, palms, aspidistras, etc., that have become pot-bound will be greatly aided by a judicious application of manure in a liquid form when they are starting to grow.

Perhaps the most simple, best, and most easily-procured form is made by taking one kerosene tin full of fresh cow or horse manure (cow preferred); put in a branbag and suspend in a barrel containing 30 gallons of water. Keep this stirred frequently for a week, and let it settle. When clear, one quart of liquid to two gallons of water will be sufficient to use.

Soot makes an excellent fertiliser. This may be prepared by putting a couple of gallons of soot (in a bag) to the same quantity of water as above, using a quart of the liquid to three gallons of water. This manure produces fine, dark foliage, and may be given to almost any plant requiring a stimulant without fear of injury. Ammonia, guano, superphosphates (besides fowl and pigeon manure), in fact, nearly all artificial manures, when the quantities and strength are known, may be dissolved in water, thereby bringing their fertilising properties into direct contact with the roots in the best possible manner.

Besides the above directions, some judgment is needed. Amateurs should use their intelligence, and they will soon learn how to vary treatment when it becomes necessary to do so.

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Dahlias.

There is no hurry about getting the tubers into the ground but where they are to be largely grown special beds should be prepared for them. Dig the ground as deeply as you can, certainly not less than 18 inches, some growers recommend 3ft., and if the tubers are not to go in for a few weeks, add some stable manure, hot and strong, the manure should be more mellow if the tubers are to go in soon. If there is not plenty of natural manure available use a pound of super to the square yard.

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An Interesting Palm.

The Talipot palm (Corypha umbraculifera), a native of Ceylon and Southern India, is one of the noblest of the whole family of palms. It is a slow grower; but attains to a height, sometimes 90 ft. or 100 ft., and, when reaching maturity, bears an enormous crown of magnificent leaves. So large are the full-grown leaves that one or two suffice for the roof of a hut. Indeed, it is no uncommon sight in Ceylon to see a whole family of Tamils marching along in a tropical shower sheltered beneath a single leaf, which serves them as an improvised and gigantic umbrella. For 70 or more years the Talipot devotes its energies to building up its massive tissues. Then, bursting into bloom, it forms a splendid spectacle, which attracts curious visitors from far and wide. Its bloom faded and its fruits set, the whole inflorescences topple over, the leaves wither and hang down, and the tree dies.

The Pæony.

For grand effect the Paeony, one of the oldest of garden favourites, does best planted in masses, or in front of a shrubbery. They require a rich soil, in fact it can hardly be too rich, and a top dressing of manure should be applied in autumn, or dug deeply into the soil in spring. A plentiful supply of water must be given at all times, especially when the flowers are opening.

One of the strongest claims to popularity of the Paeony is the fact of its hardiness, and another good point is that it is very free from insect pests and disease.

In brilliant coloring, which ranges from white to rich crimson, and perfection of bloom it rivals the rose, and some varieties are very fragrant. Though the blossoms are large they are not coarse, and though gay they are not gaudy.

Eternal vigilance is the price of success with some flowers, but the Paeony will take care of itself and each succeeding year adds to the size of the clump and the number and beauty of the blossoms. If possible make the surroundings fit in to the Paeony and do not transplant unless imperative, and then with as little disturbance as possible.

For decoration purposes and as cut flowers they are very lasting if picked when just opening, and always give a cheerful aspect to a room. It is said that the crimson flowered Paeony was cultivated in the earliest times and that Pliny had it growing in his garden. Certainly it always proves satisfactory, from the time the first red shoots appear in spring, for after blooming the handsome dark clean foliage makes an excellent background. This flower has been aptly characterized as the flower of the past, the present, and the future. In English gardens we have seen great clumps which had probably grown undisturbed for twenty years or more yet perfectly healthy.

The Tree Heath.

The real briarwood pipes are made from the root of the tree heath (Erica arborea). The plant is a native of the Mediterranean countries; the commercial supply being gathered mainly in Southern France and Corsica, where it grows wild. The peculiar dark and beautifully-mottled appearance, which some briar pipes exhibit is greatly emphasised by boiling blocks of the wood for several hours in water, at a low boiling point. The plant is by no means uncommon here in Australia, in bush form, but occasionally 10ft. to 12ft. in height. Its pretty small white flowers, most freely produced, are fragrant. It is one of the hardiest heaths.

Berberis Thunbergii.

The Japanese Barberry is a most versatile plant in its adaptations to particular requirements. It is not at all hard to suit in the way of soil, flourishing in every kind and even doing well where it is scant in depth. It is desirable for use in the general shrubbery. It is extremely serviceable where a low dense hedge is desirable. In habit it is symmetrical and graceful. When by itself it usually attains a height of three to four feet and a spread of four to five feet. Ultimately it may grow to a height of five feet. The branches, which are very numerous, are stout, slightly pendulous towards the ends, and clothed with a reddish bark. The flowers are straw colored and rather interesting but not at all showy like those of the common barberry. The fruit which follows is bright red when mature and long-persistent. It is borne abundantly each year and is retained on the plant until late in the following spring. The leave are small, agreeable in color in th summer, and in the autumn assume shades of orange and scarle and remain until late.

There are several other varietie grown, B. Darwini, an evergreen carrying rich yellow flowers, bein very handsome.

Senecios.

— The Cape or Germany Ivy. —

This very useful climber, a native of South Africa is an evergreen with dark glossy green Ivy-like leaves. The pale yello flowers, which average 2½ inches t 3 inches in diameter, are produce more or less throughout the year The usual method of propagatio is by means of cuttings, whic root readily in sandy soil. Th soft-wooded slender stems, the Ivy like foliage and the comparativel large flowers are very beautifu when the plant is trained up trellis. Another of the senecios S. canalipes, is very vigorous. Th lobed, heart-shaped leaves are ric green in colour, the yellow flower being freely produced on termina corymbs, which are usually larg and freely branched. Cuttings obtained from the small side growth root readily at almost any season.

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The Orchard.

Fertilisers for Fruit Trees.

Mr. A. H. Benson, late Instructor in Fruit Culture to the Department of Agriculture and Stock in Queensland, now Director of Agriculture in Tasmania, has published the following method of ascertaining the requirements of the soil for growing apples and apricots. The experiments here given should prove of much value to fruitgrowers :—

Experiment 1.—Give six trees 2 lbs. of superphosphate per tree.

Experiment 2.—Give six trees 1 lb. of sulphate of potash per tree.

Experiment 3.—Give six trees 1 lb. of sulphate of ammonia per tree.

Experiment 4.—Give six trees 2 lbs. of superphosphate and 1 lb. of sulphate of potash per tree.

Experiment 5.—Give six trees 2 lbs. of superphosphate of potash and 1 lb. of sulphate of ammonia per tree.

Experiment 6.—Give six trees 1 lb. of sulphate of potash and 1 of sulphate of ammonia per tree.

Experiment 7.—Give six trees 2 lb. superphosphate, 1 lb. sulphate of potash, and 1 lb. sulphate of ammonia per tree.

Experiment 8.—Give six trees no manure.

These experiments will show you exactly what the soil requires.

As regards the manuring of apples, the Director has gone carefully into the matter, and from the information available he finds, in order to produce the leaves, wood, roots, and fruit for a crop of 250 bushels per acre of apples, the following plant foods approximately, are required, namely :—Nitrogen, 34lb. ; phosphoric acid, 12lb. ; potash, 28lb.

To obtain these plant foods the following manures would be required :—34 lbs. of nitrogen can be obtained from 1½ cwt. of sulphate of ammonia ; 12 lbs. of phosphoric acid can be obtained from 76 lb. of superphosphate containing 17 per cent. of water-soluble phosphoric acid ; 28 lbs. of potash can be obtained from 56 lbs. of sulphate of potash.

As a quantity of nitrogen is required to produce the leaves, which, when they fall and rot again return to the soil much of the nitrogen they have taken from it, it is possible that the quantity of nitrogenous manure can be reduced without running any danger, in which case the following mixture should meet the case :—1 cwt. of sulphate of ammonia or 1 cwt. of nitrate of soda ; 1 cwt. of superphosphate, containing 17 per cent. water-soluble phosphoric acid ; ½ cwt. of sulphate or muriate of potash per acre. This will give a complete manure in an available form containing about 20lb. of nitrogen, 19 lbs. of phosphoric acid, and 30 lbs. of potash per acre, and should cost about 26/- to 28/- if well bought.

The ash of the wood of the apple tree is rich in lime, so that if the soil is deficient in lime a dressing of half a ton to 1 ton per acre would be of benefit. This is a matter that will be determined by the analysis.

When manuring apricot trees it must be remembered that a crop of 250 bushels at 40 lbs. to the bushel, or a total crop of 10,000 lb. of fruit per acre, will take the following plant food from the soil: —Nineteen pounds of nitrogen, 6 lbs. of phosphoric acid, and 29 lbs. of potash in the fruit alone. It will, therefore, be necessary to use the following manure per acre :—1 cwt. of nitrate of soda or sulphate of ammonia ; 1 cwt. of superphosphate, 17 per cent. soluble phosphoric acid ; 1 cwt. of sulphate or muriate of potash.

The nitrogen is somewhat low when the production of leaves, wood, and roots is taken into consideration, but the phosphoric acid and potash should be ample.

The most expensive plant food to be returned to the soil is nitrogen, and this Mr. Benson advises the grower to obtain by green-crop manuring in future, as this will materially decrease the manure bill — Queensland Agricultural Journal.

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Acetylene Plant Refuse.

Carbide utilised for the production of acetylene gas leaves as a residue hydrated oxide of calcium —that is to say, slaked lime. By the presence in small quantities of sulphur and phosphorus this residual lime, which is itself an excellent antiseptic, can therefore be used for the lime-washing of trees and bushes, with a view to the destruction of insects' eggs and parasitic larvae, and the mosses and lichens which cover them, and under which are sheltered a crowd of insects ; for the white-washing of the interior of stables, cow houses, pigsties, etc. In the poultry runs the whitewashing of shelters, perches, etc., ensures the destruction of vermin so prejudicial to the prosperity of the fowls. The residual lime taken from the acetylene apparatus may be considered as a fertiliser of the same kind as ordinary lime, and its employment should be made under the same conditions—that is to say, limited to those soils which are insufficiently calcareous, and to soils rich in organic matter ; but it is necessary not to forget that the action of liming gives economical results only when the soil contains sufficient quantity of the divers elements of fertility—nitrogen, potash, phosphoric acid—without which it tends to fatal impoverishment of the soil, expressed in the old well-known phrase, "Lime enriches the father and ruins the children." The application of lime, therefore, ought to be reserved for those soils rich in fertilising materials, notably in vegetable matter, and only on exhausted soils after they have been furnished with strong doses of farm manure or chemical manure completed by the addition of phosphates and potash.—"Toowoomba Chronicle."

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Peach Leaf Curl.

In the August issue of the Journal of Agriculture there appears a valuable contribution by Mr. George Quinn on the treatment of this disease with various copper compounds. The article in question is an exhaustive summary of the work carried out under Mr. Quinn's direction last year at the Government Experimental Orchard at Blackwood by Mr. C. G. Savage, who is in charge of that station. It should be mentioned that the trees treated were all of the same variety—Elberta—probably the most susceptible of any grown in the State. The conditions appear to have been well arranged and it may be taken that the results obtained were not influenced in any way by differences of soil, fertilization, position, or age of trees, which were, for the most part, three years planted, healthy and well grown. The total rainfall for the year was 33 inches, the winter and spring being very wet. Of the total, 22 inches fell before the first spraying and eight inches between that date and the plucking of the leaves. The weather conditions, therefore, were in accordance with what are usually considered fairly favourable to the development of the disease. It is perhaps unnecessary to state that the value of Bordeaux Mixture as a preventive of the trouble was not questioned, the object no doubt being to find a substitute which, whilst capable of more ease and exactitude in preparation, should give at least equal results.

Mr. Quinn reports that the compounds used were :—(1) Bordeaux Mixture made from 1lb. copper sulphate and ¾lb. of freshly burnt quicklime in 10 gallons of water. The solution, therefore, containing 1 per cent. of copper sulphate.

2. Burgundy Mixture made of 1lb. Copper sulphate and 1 washing soda crystals in 10 gallons of water, thus containing 1 per cent. of copper sulphate.

3. Bickford's Bordeaux Paste, 2lbs. of Paste to 50 gallons of water, its copper sulphate content being above 1 per cent. according to manufacturer's guarantee.

4. Copper Sulphate Solution—In which ¼lb. pure copper sulphate was used to each 10 gallons of water, giving a strength of quarter of 1 per cent. copper sulphate.

The first sprayings were given on August 15 and 19 when the buds were completely dormant. In cases where trees were sprayed twice, the second was applied when the buds were rapidly expanding into blooms. On 22nd of November when the trees were practically in full foliage, they were carefully gone over and every diseased leaf plucked and counted. The result is summarized by Mr. Quinn as follows :—

No. of Trees.	No. Times Sprayed.	No of Diseased leaves.
— Bordeaux Mixture. —		
6	2	14
3	1	10
— Burgundy Mixture. —		
6	2	0
3	1	0
— Bordeaux Paste. —		
6	2	0
3	1	158
— Copper Sulphate Solution. —		
9	1	17
— Unsprayed. —		
3		325

The outstanding feature of the experiment is the confirmation it affords of the certainty with which the disease may be controlled. The slight superiority of the Burgundy as against Bordeaux is not in accordance with the general belief of the relative value of these two preparations. The 24 diseased leaves from the nine Bordeaux trees means only a fractional percentage of the very many thousands, on the trees, which averaged 6½ feet high with a circumference of over 20 feet. The comparative failure of the Bordeaux Paste applied once is, Mr. Quinn thinks, probably explained by the failure of the spray is applied, to reach certain parts, the bulk of the affected leaves being found in well defined areas. Even assuming two sprayings to be necessary, this public proof of the value of this preparation is satisfactory. For home gardens we have frequently recommended it, for its convenience would in such cases outweigh any shortcomings as compared with the ordinary Bordeaux, but from what we had heard of its use in commercial orchards it appeared probable that the ordinary Bordeaux even with its well-known disadvantages, was superior. These results, however, should at least encourage growers to experiment largely for themselves. The sulphate of copper solution shows remarkably well in economy of cost of material and of application for it will be noticed that one spraying secured almost absolute immunity from the disease for two leaves per tree is next door to perfection. The amateur fruitgrower should note that in this form sulphate of copper is unsafe to use when the buds have opened. In the case of the three unsprayed trees, it is stated that ¼lb. of sulphate of iron had been applied to each. As far as we can gather no other check trees were left. It would certainly have added to the completeness of the experiment had this been done, as we have no guide as to the influence, beneficial or otherwise, of the iron, so that some little uncertainty exists as to the extent of the disease which would have occurred had spraying been neglected, but it would no doubt have been considerable.

In comparing the ease of mixing and application Mr. Quinn considers Bordeaux Paste to take first place, followed by the copper sulphate solution, the Burgundy, and Bordeaux Mixture, in that order. These experiments are being repeated this year and Mr. Quinn wisely advises caution against ac-

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cepting these results as final and adds: "If any recommendation is made it is in the direction of suggesting that orchardists should experiment with Bordeaux paste. Its simplicity and time saving qualities are all that could be desired and if properly compounded, it should be possible for the veriest novice to avoid mistakes and secure more uniform results than have been possible with the use of Standard Bordeaux Mixture."

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A Roller Tank Sprayer.

The following article from a recent issue of the "Rural New Yorker" is worth very careful consideration. The idea appears to solve one or two difficulties in present methods without creating any other unsurmountable ones.

"There is another new idea made available for orchard spraying. It is extremely simple and entirely practical. An intelligent fruitgrower has conceived the idea of having a round iron or copper tank to hold the liquid and make of it the direct means of generating the power to force the liquid into a mist in the trees. Lugs are rivetted on to the tank, which is a simple roller, to prevent any failure to revolve, and this motion makes sure of the constant agitation of the liquid inside the tank. To the centre of this rolling tank at either end, are fastened simple gearings that work two air pumps. These force compressed air into a tank that is used as any such stored power is used for forcing the liquid into the hose and out through the spraying nozzles.

It has been clearly demonstrated by several years' testing that enough power is generated in passing from one tree to another to maintain the necessary air pressure to do the spraying. All that that is needed is to fill the big tank with liquid, which for a two-horse machine holds 150 gallons, and drive a sufficient distance to fill the compressed air tank to the needed pressure before starting to spray. The weight of a machine of this size is 1,500 pounds, and when loaded with 150 gallons of liquid weighs about twice this much, making a fair load for an ordinary team on ordinary orchard ground. A tower (fortunately the Australian fruitgrower has no use for towers) and the operators would add something to this. Some of the advantages of this machine are a minimum amount of very simple machinery that the ordinary fruitgrower can understand and operate; no danger of the liquid settling during spraying; no needless or dead weight to haul, as must be with power engines of any kind; ease of making short turns; ability to travel over rough ground without capsizing; no sinking of wheels in soft ground; no extra expense for gasoline or other fuel for generating power; and durability. The cost of the two horse machine is about 350 dollars. A smaller size can be had at less cost, and larger ones could be made if desired. Within due time this new invention will make its way into general use, but at this time is in the first stages of introduction. I have known of it for two years past. We should be proud of the fact that a fruitgrower of very moderate means but of superior intelligence has invented so useful and simple a machine for the benefit of his fellow workers. It seems to have an assured future.

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To test the quality and purity of flour, take a handful from the flour barrel, squeeze it for half a minute, and then place it on the table. If good and pure it will retain the shape of the cavity of the hand, but if adulterated, the heap will fall down.

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POTATO DISEASES.

As a preventative to the spread of POTATO BLIGHT (Irish blight) SCAB, BROWN RUST, etc., Immerse all seed potatoes in SICKLE BRAND FORMALIN 1 lb. to 32 gallons water. Soak uncut tubers in the solution for 2 hours, spread out to dry, cut and plant as usual. It is important not to cut tubers before treatment.

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1/6 per 1 lb. bottle, 14/- per gallon bottle, 12/6 per gal. in 3 gallon jars, 1 gallon — about 11¼ lbs.

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CURRIE STREET.

Faking Blood Oranges.

The "Presse Medicale" says that oranges are often faked in Northern climes, where they command a higher price than the ordinary orange.

In order to transform the latter into blood oranges, certain "manufacturers" inject into the orange, through the rind, with the aid of a syringe provided with a fine needle, a solution of red aniline dye, mixed with a saccharine solution. Now recently, in St. Petersburg, a lady bought from a fruit merchant a dozen of these pseudo blood oranges. She gave one to her daughter, who was at once attacked, on putting the first piece into her mouth, by a sharp pain in the pharynx, and spat blood. A doctor was called in, and he diagnosed the pain and the haemorrhage as having been caused by a fragment of a needle which had lodged in the mucous membrane. When this fragment was extracted, it proved to be the point of a Pravaz needle, in the point of which was found a small remaining portion of aniline dye.

On returning the oranges to the dealer, he revealed that the "dodge" is often resorted to in manufacturing blood oranges.—"Queensland Agricultural Journal."

Cider Making.

How to make cider is explained simply in the following article in the "Farmer and Settler":—

Cider can be made from any kind of apple, though some are better. The fruit must be ripe—neither rotten nor unripe. When an apple is ripe enough to eat, it is ripe enough to grind for cider, but not until then.

A great mistake is often made by would-be cider-makers in mixing all sorts and conditions of apples together, as though quality and quantity were matters of no importance. Bitter, sweet, and sour can all be converted into cider, but bitter apples are the best; years of experience teaches this—the juice is the richest in sugar, it ferments more freely, it clarifies quickest, and it keeps best after fermentation.

It is always better to core apples before grinding, as the cider will not only taste and look better, but it will keep better. The extraction of the juice is the next step in the process. The apples are crushed or ground in mills, and the pulp sprinkled with one-sixth or one-fourth of its weight in spring or river water. Then allow it to remain in tubs for twelve or fourteen hours, during which times fermentation commences.

The pulp should then be placed on a kind of wicker frame or in coarse canvas bags, and after draining into suitable receivers, should be subjected to pressure in the cider press. The liquor which runs off first is the best, and should be kept separate, that which follows as the result of extreme pressure usually tastes of the pips and skins.

The extracted juice should next be put into casks with large bung holes, and freely exposed to the air, but not to the sun, the casks being placed on "stillions," with flat tubs under them to catch the waste.

They must be constantly watched, and kept full, so that the barm or yeast, as it forms, may froth

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er and be carried off from the rface.

\s soon as the sediment has bsided—which will take two or ree days for weak, and eight or n days for strong cider—the uor should be racked off into an casks previously sulphured th a cooper's match.

The casks containing the racked ler must be stored in a cellar in a cool shed, and left there r some months to mature, when ey can be re-racked for sale, or r home use.

Cider may be preserved for years being put in air-tight cans, nilar to those used for canning uit. The liquid should first be ttled and racked off from the egs, but fermentation should not allowed to commence before nning.

Poultry in the Garden and Orchard.

I notice (says a writer in the Feathered World") that there ve lately been many reports of rden and field crops—especially bbage and similar vegetables— ing ruined by the depredations of numerable caterpillars, and in any quarters other injurious in- cts and grubs are making the e of a tiller of the soil anything t a bed of roses. For an all-und grub and insect extermina- r, the common or "garden" wl would be hard to beat, and anv market gardeners and others e waking up to this fact at last.

Fowls are in a great many cases assed with the members of the line tribe as being the natural emies of the gardener, and cerinly the way in which a hen with brood of chickens will insist on arranging to her own liking ery carefully prepared seed-bed e can gain access to is somehat irritating, but the usefulness poultry as an adjunct to garning is now being more and more cognised.

A hen will turn over a lot of ound in the course of a day, pecially if she is at all hungry, d whilst so engaged will disver and consume a surprising antity of grubs and other things hich are not exactly beneficial to e growth of fruit or vegetables. any market gardeners now make practice of running a few fowls r a week or two on each portion their land as they clear off the ops. They wire off a certain nount of ground, place a portable house, and perhaps a score of fowls in the enclosure, and lightly fork over a certain portion of the enclosed space each day.

Weeds, worms, and grubs, soon disappear, from the surface soil at any rate, and if the weather is at all fine and dry, the soil is rendered first-class growing condition by the birds constantly working in it. And the destruction of the insect pests is not the only advantage to be gained. The birds both clean and manure the ground at the same time, and, as is well known, poultry manure is one of the richest, on a par almost with guano, and the birds thus save labour and expense in this direction also.

Grass land of a poor nature benefits greatly by poultry being run on it, and heavy crops of hay have been cut off land which, previous to the birds being placed upon it, would hardly provide food for a few goats.

Why Plants Grow Upwards.

Why do plants grow upward? Most of us would say that they grow towards the light. But the light explanation does not cover the ground, else in this latitude, writes "The Garden," all the trees in the fields would bow southward. The uprightness of trees and plants, an immensely useful quality, must have some other cause. Mr. Francis Darwin, in a lecture to the Royal Society, has been giving the results of some interesting experiments on the subject, dealing with the question why the plant grows upward and its roots down. In the tips of the roots of certain seedlings it was found there were special cells, each containing a free starch grain, which naturally sank to the bottom, and changed its position if the plant were laid on its side. The starch grain, always responding to the earth's downward attraction, keeps the plant informed of which direction is up and which down, and so supplies a stimulus determining growth in a vertical direction.

Mr. Darwin tried plants laid on their sides, and stimulated by a sidelight, but still they grew upwards. When the plants were placed on a vibrating surface, so that the starch grains tapped on the bottoms of their cells, the upward curvature of the growth was increased, the gravitational stimulus being made more active. The fact that the gravitational apparatus is situated in certain definite regions, such as the root-tip, where it is required to determine the direction of growth, suggests that it belongs, Mr. Darwin says, to "that type of physiological machine which we call a sense-organ." Who shall say now that plants live but do not feel?

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Orchard Notes for September.

The grafting of trees may be done any time this month if the scions have been kept dormant. For crown grafting of large trees it is necessary to wait until the trees are in leaf, and the bark is free.

Dormant buds and early grafts want looking after. All growths except from the bud or graft should be suppressed as soon as they show. When the shoot from the bud or graft is 6in. long tie it carefully to a stake or the projecting piece of stock, if one was left, to prevent its being blown off, thus wasting a year.

Loquats may be planted, Sewell's Enormity is good, also plant olives, guavas, feigoa, carobs, etc.

Keep a watch on the growth of newly-planted trees. Rub off all buds not required to produce shoots and regulate the growth of shoots by nipping out any which grow too strongly. The man who will prevent shoots from growing where they are not wanted, and will guide others in the way they should grow, will achieve much better results than the man who depends on winter pruning. Stake trees where necessary. As the head grows, wind pressure is of course increased, and may be diastrous till the tree gets a firm hold of the ground.

Watch for the peach aphis, and if it appears spray well with strong tobacco water, resin wash, or kerosene emulsion, and do it at once.

For young and small peach trees, and where only a few leaves are attacked by curl leaf, carefully pick off all leaves as soon as they show signs of it. These should be burned.

Dig or plough the ground as soon as possible, covering all the weeds, which are plentiful this year. As the month advances use the cultivator, or hoe, or digging fork, to work down the rough surface before it cakes, and keep it worked through the summer.

It is not too late to apply soluble manures to fruit trees. If it is desired to encourage growth in a fairly healthy tree apply, say, from a quarter to 2lb. of nitrate of soda on the ground round the area of the roots. Sprinkle it on the ground evenly well out from the trunk, and fork it in; later rains will wash it down to the roots. The quarter of a pound mentioned is for a tree two years old, and the 2lb. for one, say, 10 or 12 years old. An old warrior may have more. If the tree makes good growth but does not fruit well, on no account apply nitrate of soda, sulphate of ammonia, stable manure, or other nitrogenous manure. In this case potash may be useful, but the best plan is to omit all manure and summer prune, allowing no shoots to grow more than a few inches. Not only nip off the shoots, but rub off all that are too close together. For trees which bear, but the fruit is not as fine as you think it ought to be, an application of nitrate of soda, superphosphate, and sulphate of potash may be desirable. For a tree, say, 6ft. to 8ft. high, and as far across, perhaps 1lb. nitrate, 3 to 6lb. superphosphate, and 1lb. potash may be scattered over the ground round the tree from 3ft. to 5ft. from the truck, and forked in.

Plant citrus trees and disbud older trees when they are making too many shoots. Orange trees are probably more particular as to conditions than any other commonly grown fruit tree, and soil and subsoil must be the first consideration in commercial planting. For the home garden, however, either the soil may be made right or the trees may be left to do the best they can. Fair fruit is grown even on shallow limestone soil or where a heavy clay is within a few inches of the surface but the trees are likely to be comparatively short-lived, and the fruit, though abundant, will not equal by a long way, that grown on the deep, well-drained river flats. The trees, however, are so handsome in foliage, flower, and fruit, that no garden can be said to be complete without a few of the citrus tribe Washington Navel, Joppa, and Valencia Late, in oranges, Beauty of Glen Retreat and Thorny in Mandarins. Poor Man for preserving and Villa Franca in lemons would prove a nice selection for the suburban garden. The Kumquat makes a handsome appearance and the fruit makes an excellent preserve. In Grape Fruit or Pomelo Marsh's Seedless or Triumph are recommended. By the way, if any reader wishes to enjoy grape fruit without either growing or buying it he can do so by letting a few Poorman oranges become fully ripe on the tree, then storing them for three weeks in a cool dry place and eating with plenty of sugar. Cut the fruit in halves through the greater circumference and scoop out the pulp with a spoon. We got the idea from Mr. Wicks and are just waiting for some particularly fine Poorman's we have this year to ripen before commencing operations on the above lines. We hav eaten grape fruit many years ag and as far as we can recolle did not think a great deal of i. perhaps the substitute will be better than the original, which it s said to greatly resemble. An how, as even one or two Poorma trees will, in a good year, tax th marmalade consuming capacity o an ordinary household, this method of disposing of the surplus may be useful.

In many old gardens there ar orange and lemon trees which ar really not worth the room the take up or trees which, owing t past neglect, are in a non-fruiting and a generally unsatisfactory condition, even when the variety is fairly good one. In such cases i is not usually difficult to bring about a much better state of affairs. To do so, cut out all dea and dying wood, and shorten bac the top generally. See that th trees are free from scale, and i not spray well with resin wash Open up soil round the base o stem down to the main roots, an see if the trees are free from collar rot; if not, cut away decaying bark, wash well with bluestone solution, 1lb. to the gallon of ho water, and paint wounds (not th sound bark) right up to the edges with coal tar. Apply 4lb. fin bonedust or 2lb. super, or a goo sprinkling of fowl manure, or failing these, rotted stable manure Dig well and fairly deeply, becaus the trees will have to make nev roots; then mulch well with stabl manure, and keep trees watere during the summer. How hard t cut depends on the condition o the tree but the worse it is th harder should the cutting be. I can be done all at once or hal this year and half next.

Where the variety is a poor on and the tree in a bad condition i is better to take it right back t the main stump and crown graf on either one or a number of goo sorts. Early this month is a goo time to do the work or as soon a the bark will lift easily. The scions should be in a practically dorman condition. The more grafts tha are put in the quicker will be th healing. One every two inches o the circumference is not too many When the grafts begin to grov they will need support. A ligh covering supported on stakes couple of feet above the stump wil prevent sun scalding or a kerosen tin or box without top or botton may be placed over the stump and filled to the level of the stum with some light loam.

Grafting Old Trees.

Grafting may be done at any season of the year, but there are certain times which are particularly favorable for certain kinds of grafting. For example, bud grafting is best done when the sap is moving freely, whereas the ordinary grafting of deciduous trees is best done when the sap is just rising. Speaking generally, when a piece of wood is used for the graft,. it is best applied to the stock in a dormant condition not only to apples, pears, peaches, plums, and such deciduous trees, but also to oranges, lemons, olives, the carob, and so forth.

In every orchard there are trees which produce fruit of comparatively little value. If such trees are vigorous and healthy, it is advisable to rework them with scions from productive, valuable sorts.

To do so chop the top of the tree off about 18in. or 2ft. from the ground, then make a clean cut with the saw 9in. or a foot from the ground. The object of chopping the top off first is to prevent the trunk from spitting where it is intended to insert the grafts. Of course, if care be exercised the tree can be taken down in one operation; but it is important that the surface where the grafts are to be inserted should be uninjured. With a pruning knife, draw knife or spokeshave smooth off the top of the stock where you intend to put the grafts, dividing the distance as near as possible, so that there shall be a graft not more than 3in. apart.

The method of cutting the bark of the stock is to make a slit down the bark for an inch or an inch and a half, so that the bark on each side can be lifted.

The scion, which should, of course, have been secured while the parent tree was dormant, is cut either with a shoulder, or with a slanting cut, which is much quicker, answers the purpose admirably, and rarely fails to make a good union.

One or two eyes or buds are left on each scion. If two the upper bud will point inwards, and will grow strongest, and it should be pinched off when it has reached a few inches in length, and must be kept pinched to force the growth into the lower bud, which grows outwards, and, therefore, tends to form an open centred tree. If this is not done, it is preferable to have only one bud on the graft, and have that bud point outwards. In having two buds, however, two growing points are provided for each scion, and the chances of failure are proportionately lessened.

The bark of the stock being lifted, the scion can be easily pushed down into place, so that the whole cut surface of the scion fits closely against the sap wood of the stock. As the scion is frequently as thick as a lead pencil, it will naturally lift up the edges of the bark of the stock. The operator then takes a sharp knife and quickly and neatly trims off the edge of the bark, so that it will fit close to the scion.

Having inserted all the scions and fitted the bark, they are all tied tightly with a piece of binder twine or similar bandage. Tie as tightly as possible, in order to keep the scions close to the stock, and to prevent the bark from lifting and forming cavities.

When the grafts are in position and have been bandaged, a good coat of grafting wax is applied to the whole cut surface, and down the side of each slit, in order to keep out the air. Inserted in this way, and treated as described, there should not be 5 per cent. of failures of scions taking. Although a new tree can be formed from one shoot, anyone who knows how difficult it is to get the bark to heal over the wound will realise the importance of having as many healing points at regular intervals as possible. At the point of insertion of each graft, new tissue is formed, and the healing process goes on perfectly regularly all the way round the stock, however thick it may be. Whereas if one scion dies out, there is a weak place there, and the healing is uneven. It is a wise precaution to shade the north side of the stock.

When the grafts have taken, shoots which are not wanted to produce permanent branches should be stopped back ¾in. from the stock, and kept stopped. As long as there are several leaves on them, the healing of the wound will go on, and the main strength will go into the permanent branches.

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Black Spot and Codlin Moth.

The time to spray for Black Spot and Codlin is at hand. For the former use Bordeaux Mixture applied just as the buds are opening into flower, but it is better to spray later than not at all, probably one cannot get nearer the truth than to say that the nearer the opening of the flower the better the results. For Codlin Moth spray with Arsenate of Lead when the petals of the flowers are falling. In both cases best results depend on the use of the best quality materials properly mixed, and on catching the trees at the right time. For the former, as for all fungus diseases, Bordeaux is the standard remedy. It has not been definitely proved that spraying in full bloom is harmful but for preference do it before this stage. Should the weather be moist and the spray be washed off, the work must be done again. If not done effectively the first time and the trees are to be sprayed for the moth the Arsenate of Lead may be combined with another application of Bordeaux Mixture.

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Nitrate of Soda for Market Garden Crops.

The question of the proper use of nitrate of soda is of special importance because (1) it is an expensive fertiliser; (2) it furnishes only one element of plant food, namely, nitrogen, and (3) it furnishes nitrogen in a form which is highly soluble, consequently is not only quickly absorbed by the plant roots but is also readily washed out of the soil and lost. In order, therefore, that this fertiliser may be most economically and profitably employed it is necessary not only to use it in proper amounts but to apply it in such a way that the nitrogen is used by the plant to the fullest possible extent, for if the quantity found to be necessary for a definite increase of crop, under average conditions, were all applied at once, say in the early spring, a greater opportunity would be offered for losses from leaching than would be the case if the material were given in successsive dressings, so that the losses due to the escape of the nitrogen would be minimised; on the other hand, if no losses occurred, the plant might take up more than could be utilised in a normal development, thus defeating the purpose, because resulting in a product of less commercial value. This would apply, of course, only in the case of those crops that are injured by abnormal development in certain directions, as, for example, too large a proportion of straw in cereal grains, too large a root in sugar beets, etc. All these difficulties may be obviated by a fractional application, or, in other words, by supplying the nitrogen at the time and in the quantity best adapted for the plant and for the purpose in view in its growth. This definite quantity must be to a certain extent a matter for individual experiment.

Some experiments at the New Jersey Experiment Stations were planned to determine not only the best amounts of nitrate to use in case of various garden crops, but also the best method of application. The land used in the experiments was very fertile. The results obtained with the different crops were briefly as follows:—

— Cabbage. —

With this crop there was a yield of but 910 prime heads per acre when no nitrate of soda was used. When 300 pounds of the nitrate was applied per acre in two equal dressings the number of prime heads obtained was 3,260. When the same amount was applied in acre in two equal dressings the prime heads per acre, was 5,390. On the plot which had received 400 pounds of nitrate of soda per acre in two equal dressings the yield was 4,160 prime heads per acre, and when this same amount was supplied in three equal dressings 7,580 primes heads were obtained per acre. From these figures it will be seen that the use of the nitrate of soda greatly increased the yield of prime heads in every instance. It will further be noticed that when the nitrate was applied in three equal dressings the largest yields were obtained. Applying the nitrate in three dressings proved more effective in increasing the yield than increasing the amount 100 pounds. For example, 300 pounds in three equal dressings. Not only was the yield much greater than on any other plot but the quality of the cabbage was much improved, the heads selling for 50 per cent. more than those from any other plot.

— Celery. —

As with the cabbage crop noted above, 300 and 400 pounds per acre of nitrate of soda were used on different plots in two and three equal dressings. The average increased yield of all the plots, due to the use of the nitrate, was 17,810 pounds or 132 per cent. This was on good land previously well fertilized with 450 pounds of high-grade fertilizers. No marketable celery was obtained when the nitrate was not used, and the use of the ground, expense of growing, etc., was a total loss. Where the nitrate was used the crop was worth on the average £75 per acre. The cost of the nitrate was but 30/. This is equivalent to a gain of roughly £11 for every 4/- invested in the nitrate of soda. As to the influence of the amount applied the average increased gain due to the use of 400 pounds of nitrate was 255 marketable roots, worth £5. When the nitrate was applied in three equal dressings there was an increased gain on the average of 495 plants, worth £6 over the yield obtained when the application was made in two equal dressings. The gain from the third application was considerably larger when the 400 pounds of nitrate was applied than when 300 pounds was used, the value of the increased gain in the former case being £11 and in the latter £3. These results indicate the value of a liberal quantity of nitrate of soda for celery as well as a judicious distribution throughout the season.

— Tomatoes. —

With tomatoes the heaviest yields were obtained when 200 pounds of nitrate of soda was per acre in three equal dressings. The increase in the yield in this case was 5,880 pounds. When the same amount of nitrate was used in two equal dressings the gain was but 3,220 pounds. When 300 pounds of nitrate of soda was used in two equal dressings the increased yield was 4,610 pounds. When the same amount was applied in three equal dressings the increased yield was but 3,540 pounds. The third application in

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this case caused a larger growth of vine and later maturing fruit, thus considerably reducing the yields.

— Turnips. —

Where no nitrate was used the yield was 8,230 pounds per acre; when 200 pounds was applied in two equal dressings the yield was increased to 12,740 pounds; and when in three equal dressings the yield was but 11,220 pounds. When 300 pounds was applied in two equal dressings the yield was 16,520 pounds, and when in three equal dressings the yield was but 13,360 pounds. These figures show that while there was a greatly increased yield in every instance due to the use of the nitrate of soda, the best yields were obtained when the nitrate was applied in two equal dressings rather than three. The late dressings seemed to induce growth of tops rather than of roots. The greatest profitable crop was obtained from the use of 300 pounds of nitrate of soda in two equal dressings.

Orchard Studies.

— The Laterals of Apple Trees. —

Mr. E. E. Prescott, Principal, School of Horticulture, Burnley, in a recent issue of the Victorian Journal of Agriculture discusses the question of the management of laterals, which he writes, is often one of great concern to apple growers, and the resultant tree and its generous crop depends entirely upon the treatment that the tree laterals receive. In tree-building, therefore, the study of laterals is of the utmost importance.

First of all, the definition of a lateral must be decided upon. To serve the purpose of the present study, the wood of apple trees above the trunk may roughly be classified into two classes, viz., leaders and laterals. The leaders comprise the wood that forms the framework of the tree, and they terminate at the growing points. At various intervals along the leaders, buds are placed, and these buds break out into growth, forming much weaker growths than the leading points, and also growing at varying angles from the leaders. Sometimes these buds develop into short fruiting spurs attached immediately to the leaders, but more often they continue their growth until they are some inches and even feet, in length. These are the laterals, and these are the growths that should carry the crop of the tree. There are very few varieties of apple trees which carry their fruit spurs directly on the leaders; the majority in general cultivation produce the fruiting spurs on the laterals, and these therefore are a valuable consideration.

According to the situation of the lateral on the tree, so is its vigour determined; the nearer to the termination of the leader, the stronger becomes the lateral. Laterals in this position often show a desire to become a leader, so strong does their growth occur. Strong laterals should never be encouraged on the tree, as the fruiting wood requires to be fairly weak in development and in character. All strong growing laterals, therefore, particularly those near the top of the leader, and which often show an ambition to become a leader where one is not required, may be suppressed or removed altogether.

Where the lateral growth is very generous, and where thus an excess occurs, the superfluous ones may be removed. But it should not be forgotten, that when once a lateral is removed, it can rarely be replaced. Apple trees do not always possess dormant buds at the base of the laterals; and should the lateral be cut out it cannot always be replaced by another lateral, or by fruit spurs. Even should the trees possess the power to spur at the base of every lateral after its removal, it is an open question as to whether this is an eminently desirable attribute. Suppose these spurs were heavily laden with fruit, and owing to either the weight of the fruit or to careless picking the fruiting spurs were broken off, that portion of the tree would become permanently barren. But such a possibility is far less likely to happen when the laterals remain.

Assuming then that the trees have a fair amount of weak, angular or pendant laterals, it may be confidently accepted that these will ultimately bear the requisite crop of fruit. There is no necessity to shorten back these laterals in their early growths. They may be rigorously left alone until they have borne their first fruits. They will generally do this towards the end. The weight of the fruit will bend down the lateral, restricting the sap flow, and thus causing spur development gradually along the lateral right to the base.

When the lateral has, to use an every-day term, "spurred up," it may be shortened back, or it may be left severely alone, according to the necessities of the situation, the productiveness of the soil, and other considerations to be studied by the grower. There is always the danger that if the laterals are left unpruned for any length of time, the basal spurs, which are the weaker, will gradually lose strength and ultimately die. Once any signs of weakening appear in the spurs towards the base of the lateral, it should be considerably shortened back, to conserve strength and to prevent fruit barrenness.

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Vegetable Garden.

Notes for September.

— For Earlier Districts. —

The following indicates the general work to be done in the vegetable garden in September, under conditions, such as the neighborhood of Adelaide. Sow French beans, Runner Beans, China beans, Lima beans, Asparagus beans, Cassack beans, New Zealand Spinach, capsicums, chilies, Cape gooseberries, cucumbers, sweet and water melons, marrows, trombones, tomatoes, pumpkins, ochra, sweet corn. Plant sweet potatoes. Make late sowings of peas, lettuce, radishes, mustard, turnips, cress, carrots, parsnips, white beet. Finish planting cabbages, onions, and potatoes. Hoe and earth up previously sown or transplanted crops. Thin out and weed root crops.

FOR LATER DISTRICTS.

In later localities, sow and transplant asparagus. Top dress established plants. Broad beans—Sow for successional crop. French beans—Sow a few in warm situation. Beet—Sow largely, if not done last month. Brocoli—Sow largely, if not done last month. Brussels sprouts—Sow towards the end of the month for succession; transplant former sowings. Cabbage—Sow twice in the month; plant out former sowings. Cauliflower—Plant out largely in a low situation. Capsicum, ochra, and tomato—sow a few in the cucumber frame, also egg plant and capers. Carrot and parsnip—Sow largely of late sorts for autumn and winter use, and a few of early sorts for summer, if not done last month. Celery—Sow a few towards the end of the month in the open ground, and under protection for the autumn crops. Cress, mustard, and radish—Sow fortnightly. Cucumber—Sow a few in the frame to plant out in October, plant out in special situations. Garlic, leeks, and herbs—Plant early, if not done last month. Kohl Rabi—Sow in drills to remain. Lettuce—Sow largely, to use early in December. Onion—Sow thickly for pickling, bulbs to ripen in January. Peas—Sow largely, chiefly late sorts, to use from December. Potatoes—Finish planting early on high grounds; commence for a full crop in low grounds. Rhubarb—Sow early, if not done previously. Salsify and scorzonera—Sow early, if not done previously. Savoy cabbage—Sow early and late sorts for winter supply. Sea kale—Sow early, if not done; continue blanching established plants. Spinach—Sow largely, if not done in August. Turnips—Make a good sowing towards the end of the month, to use from November. Melons, sweet and water, vegetable marrow, pumpkin, and squash—Sow in the open ground at the end of the month, and transplant from the frame if the weather is mild.

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Carelessness is really laziness under a more polite name.

Tomatoes, Cucumbers, Etc.

The special work for the month in the earlier districts is pre-eminently in connection with the distinctly summer crops, especially tomatoes, cucumbers, marrows, and trombones. Those who have raised early plants in hot beds will have them well advanced. Some will have already set out plants in warm sheltered situations. But for most people now is time enough, and in most places little is gained by sowing the seed in the open until at least the latter end of the month.

Tomatoes may be raised in a hot bed or in pots or boxes covered with sheets of glass and kept in a warm place. As soon as the plants have made a little growth they can be taken to the cool frame, and there cared for untill the weather and soil are suitable for planting out.

Those who have not raised early plants are recommended to buy them from the nursery; try and get plants which have been hardened off and show sturdy stems and dark green foliage.

Now is a good time to prepare the beds by double digging and amply manuring the ground with well-rotted manure, wood ashes, and superphosphate (½lb. to 1lb. to the square yard), thoroughly mixing it with the soil to a depth of 15in.

When ready the plants should be set in rows four feet apart and two feet in the rows. For early plants it is a good plan to have a number of small boxes with the tops and bottoms off and calico nailed over. These should be placed over the plants at night time and in cold weather.

Cucumbers, Melons, Trombones, etc., all require much the same treatment as tomatoes. Light soil, and plenty of well-rotted manure are the two most essential requirements. Early plants may be raised and treated much in the same way as tomatoes. It is little use planting the seeds of any of these in the open beds till October, unless the situation and soil be very favorable, as they will not germinate without a fairly high degree of heat. It is therefore well to raise early plants in the hot bed, harden off, and plant out as directed for tomatoes. Cucumbers should be planted first, then trombones, and marrows. With melons not much will be gained by early planting, as the later-sown plants come right away and thrive much better.

Publications Received.

The amount of damage done to farm, orchard, vineyard, and garden crops, by cut worms or, as they are variously called, Cut Worm Caterpillars, Looper Caterpillars, Climbing Cut Worms, Army Worms, Take-all-grubs, etc., must, in the aggregate, amount to many thousands of pounds. In individual cases the loss is frequently severe, whilst few growers of wheat, oats, barley, maize, grapes, plums, tomatoes, onions, beans, cabbages, and potatoes, are altogether exempt from the trouble caused by them. In the July issue of The Journal of the Department of Agriculture of Victoria, helpful articles by Mr. C. French, Jnr., now Acting Government Entomologist, and Mr. F. de Castella, Government Viticulturist on the various preventive and curative treatments applicable to this pest were published. These have now been reprinted in pamphlet form, a copy of which we have received. Mr. French describes the life history, appearance, and habits of the cut worm family, and enumerates the different methods which have been successfuly used in combating the trouble in connection with farm and garden crops.

These consist principally of clean cultivation as a preventive measure with Paris green, poisoned bran mash and arsenate of lead spray as more directly destructive agents. Mr. de Castella deals fully with the cut worm question, as it affects the vine. Acetylene lamps of special construction are suggested as a means of moth destruction, thus preventing the trouble at any earlier stage in the life cycle of the "worm." Poisoned baits, direct spraying and the growing of plants through the vineyard, which are readily eaten by the worms, such plants to be treated with arsenical sprays, are amongst the methods which are suggested.

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PROTECTED NATIVE BIRDS.

This is the title of a special bulletin recently issued by the Department of Agriculture. It is a valuable production which owes its origin to Mr. T. Duffield who is one of those who have long recognised the imperative importance of the preservation of our feathered friends. That the farmer and fruit grower also has a number of feathered enemies is surely no reason why the whole bird world should be left to the tender mercies of the casual shootist and the even more disastrous attentions of the small boy in the nesting season. The object then of this very useful and long needed work is to enable the crop grower, who often destroys his friends in ignorance of their kindly efforts on his behalf, to distinguish them from his foes against whom he may justly make war and also to educate the amateur sportsman and the aforesaid small boy as to the appearance and habits of those birds, the destruction of which will make him liable to the attention of the police. Mr. Alfred G. Edquist is responsible for the admirably concise and clear descriptive matter whilst very great credit is due to Mr. Alfred Vaughan for the beautifully executed lithographic work which together make the book extremely valuable for the special purpose for which it has been issued as well as interesting and helpful to all bird lovers.

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Bordeaux Mixture.

There is no doubt that a good deal of disappointment occurs in spraying with this mixture, because sufficient care is not taken in its preparation. In the first place it is essential that the lime be so constituted as to combine chemically with and neutralize the copper sulphate. To ensure this, good stone lime freshly slaked should be used, on no account should air-slaked lime be used. It is also important that the mixture be made in such as way as to produce a very fine percipitate, which will be held in solution without settling for as long as possible, otherwise continuous agitation in the spray pump will be necessary. To make such Bordeaux it is necessary that the lime be of good quality and that both it and the sulphate be fully diluted before being added together.

Weight of Rain.

It may not be known to every reader that 1 inch of rain represents 100 tons per acre, and that 30 inches means 3,000 tons per acre, or, to be still more sensational, 300,000 tons of water on 100 acres of land in each year. Such are, however, the absolute facts, and show very clearly how futile would be our efforts to "water" our fields as the bardener waters his little plots. To calculate the vast amount of water which falls upon one square mile of country in the course of a year would be easy, but the weight of water thus precipitated would be beyond the powers of imagination to grasp.

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Kapok, the material largely used for stuffing pillows, mattresses, cushions, chairs, etc., also now being used in the manufacture of lifebelts, lifebuoys, etc., is the floss surrounding the seeds of a tropical plant named Eriodendron orientale, which grows largely in Java and other parts of the Dutch East Indies. There is another plant which produces kapoc in a smaller degree; this is the Bombax malabaricum. Propagation of the kapok plant is effected by seed and by cuttings. The seeds yield an edible oil; the wood is used for tanning leather; from the bark a medicinal gum is obtained; and the leaves are sometimes used as a substitute for Okra (Hibiscus esculentus).

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Turning the grindstone is hard work; but if you think of it as a muscle developer it will help out.

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The Farm

Provide Pasture for Pigs.

If one would meet with the greatest success in pig raising, he must supply plenty of good pasture. Grain is too expensive to feed alone, especially through the whole period of a pig's growth. By providing a suitable pasture, pork can be produced at a much lower cost than where the pigs are confined, and fed throughout their growing days.

Rape of the Dwarf Essex variety, sown at the rate of five or six pounds to the acre, will furnish a large amount of food. It is not advisable to turn pigs into rape until it is ten or twelve inches high. If one can divide the pad-field with low, movable fences in such a way that the hogs can be turned on to a part at a time, thereby giving the other a chance to start again, much better results will be obtained. If you grow pigs, do not think that any labor, spent in providing green feed for them, will be wasted. Such feed will not only cause your pigs to enjoy better health, but will go a long way towards the economical production of prok.—A.F.T.

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Horses and Ensilage.

Ensilage, though not very generally used for horses can be fed successfully under proper conditions. In feeding care should be taken that it is not mouldy, and not more than 20lb. per day should be fed to a horse. This should be introduced gradually, and should always be mixed with concentrated food, such as chaff, bran, or oats. Working horses should be fed lighter than a horse merely grazing. If horses are fed with ensilage in the above manner it will prove very profitable with no bad results. In ensilage feeding the novice makes a mistake in assuming that ensilage is a perfect food, and that animals should be given all they can eat. The Ohio Experimental Farm says :—"The horses were given one feed of 20lb. per day in place of the usual amount of hay, and it was certainly a benefit. Their appetites were sharpened, and the healthiness of the food was further manifested in the new coat of hair which came with the usual spring shedding. The coat was glossy and the skin loose, and the general appearance was that of horses running upon pasture."—Exchange.

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Calf Feeding.

For at least six months the calf should be well fed and cared for. If fed on large quantities of skim milk only, the constitution of the calf is endangered, the joints become enlarged, and the heifers will be poor milkers. This is due to the absence of fat in the milk, and this must be constituted with some good calf-food, cod-liver oil, crushed linseed, or pollard. After removing the calf from its mother, keep it on the hungry side from twelve to twenty-four hours, and very little trouble will be experienced in feeding it. They should receive whole milk for two or three weeks, during which time they will probably consume from one to one and a half gallons per diem. They should be fed three times a day, and at regular intercals, and care must be taken not to overfeed or scours will result. From three to five weeks old they require 12lb. to 18lb., and from six to eight weeks, from 14lbs. to 22lbs. per day. The milk should always be fed at a temperature of not less than 90 degrees or more than 100 degrees. After a fortnight or three weeks skim milk may be given, but the change must be gradual. For instance, if 12lb. of new milk is used, the first day give 11lb. new and 1lb. skim, then 10lb. new and 2lb. skim, and so on. Immediately on completion of the change some concentrated food must be added. From four to six weeks old they should be allowed a small quantity of crushed oats and bran. It is not advisable to feed green lucerne before three months old as it is likely to cause scours. Before turning the calf out to pasture, it is best to give a little green feed, which should be gradually increased until all green feed is fed.

The greatest point to guard against in the rearing of calves is scour, principally caused by overfeeding, irregular feeding, cramped pens, stagnant water, or milk fed at too high or low temperature. Scouring may be cured by starv-for one day, and then feeding lightly, gradually increasing the quantity as the calf improves. Give the calf 1oz. of castor oil in milk the first day, and the next 3oz. of castor oil to 1-2oz. of laudanum and 1-2oz. of chlorodyne. Lime-water is also another good cure—a cupful about three times a week, given in milk. In severe cases small doses of whisky, brandy, or gin may be used.—Exchange.

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Fly-Blow.

It is only during recent years that fly-blow has become a pest amongst Australian sheep. Until the nineties fly-blown sheep were practically unknown, but of late they have become in some districts so common as to constitute a serious menace to profitable sheep husbandry.

The flies mostly concerned in the production of this trouble belong to the genus Lucilia, which are characterized by their bright metallic colours, short and round abdomen, wide-set wings, and a soft proboscis. The most pernicious of the genus are :—

(a) Lucilia macallaria—"It measures 9 mm. to 10 mm. (one-third of an inch), and is recognized by its blue thorax streaked with three darker blue bands of a purple tint ; the pads are black and the wings brown at the base." (Neumann.)

(b) Lucilia sericata is somewhat similar but golden-green in colour.

The trouble is most prevalent during mild winter and spring weather from July onwards. At these seasons the immature grass produces a laxative effect, and the tail and rump wool is so "dirtied" as to attract the fly, and be a suitable spot for the deposition of the blow. It is also well known that the fly is most active in sultry weather and after rain, and at such times a sharp look-out should be kept for the uneasy restlessness, stamping, biting, tail-shaking and running about, which are the first indications of the torment of burrowing maggots. Sheep with dirty tails and rumps rom diarrheoa should be especially watched.

— Treatment. —

The curative treatment of "the ly," so far as destruction of the maggots is concerned, is simplicity tself, for the pests are extremely sensitive to the action of numerous agents, such as spirit of tar, kerosene emulsion, solution of creolin, or any of the phenyle dips. Tobacco water and arsenic solution will also kill them, but watery solutions do not blend with the greasy wool and skin, and hence they do not penetrate sufficiently far. The drawback to curative treatment, however, is that there are usually successive invasions of the fly, because the scalded spot or wound is in suitable condition for the deposition and development of successive "blows," so that the treatment involves a lot of trouble, and may have to be continuously repeated. Such repetition of treatment is practically impossible on extensive sheepruns, and it is even more impracticable in a large number of cases to apply medical agents. Many of the sheep are never seen for days together, and it hence becomes the supreme object to procure the prevention of the attack of the fly. Almost any substance with a pungent aroma—kerosene, eucalyptus oil, oil of rue, phenyle, creolin, tincture of assofoetida, and the like —will deter the fly, but their effects are usually evanescent. There is one substance, however—fish oil—he foetid aroma of which persists or months, and it is said that a ew drops of it sprinkled on the wool in the region of the tail will prevent the attack of flies throughout the season.

The fish-oil recommended is the ordinary fish oil of commerce, procurable from any wholesale chemist. It is sometimes sold under he name of train oil. When reshly prepared it is comparatively clear oil, dark brown in colour, and non-volatile, but later on it may develop flocculence or sediment. The disagreeable, penetrating, and persistent odour also increases the longer it is kept on account of the development in it, by oxidation of the oil, of a substance called valerianic acid, on which its odour depends, and which is also present in minute quantities n decaying cheese. It is this quality or power to keep on forming the stinking and acrid valerianic acid when exposed to the air which renders it superior to most other substances as a deterrent of blow-flies. As the odour volatilizes it is replenished, so to speak, by further formation of acid, and so long as traces of the oil remain in the wool—and the oil itself does not volatilize or dissipate readily—so long will the odour persist and deter attacks of the fly.

Another dressing that has been used with success in keeping the sheep to which it was applied free from attacks for the season is—One part crude carbolic acid crystals dissolved in fifty parts of crude vaseline. To this mixture add one part sulphur to two parts of the mixture. In this case it is probably the gradual decomposition of the sulphur and the consequent continuous formation of sulphurous acid gas (So_2) which accounts for the lengthened deterrent effect.—S. S. Cameron, M.R.C.V.S. in The Victorian Journal of Agriculture.

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The Milk of the Jersey Cow.

The milk of Jersey cows is not easily tested by sample. On account of the larger size of the butter globules of this than of any other breed of the British Islands, the cream rises quickly. Three samples, drawn at one time from different depths of the pail of milk fresh from the cow, have been found to differ very considerably, the proportion of butter-fat being greatest in the uppermost and least in the lowest samples. For this reason also it has been said (whether truly or otherwise) the milk of two or three Jersey cows, mixed with the milk of other dairy cows, not only causes the cream to rise faster than in the milk of ordinary cows alone, but brings a larger quantity of cream to the surface, the larger globules of the Jersey milk attracting and carrying up with them the very small globules which, but for the attraction and buoyancy of those of the Jersey milk, might never reach the floating cream. Some dairy managers, on the contrary, do not approve of this practice of mixing. The specific gravity of Jersey milk is somewhat less than the average of milk in general, which a competent authority has reckoned at 10½ lbs. to the gallon; perhaps 10 lbs. or very little over to the gallon (imperial weight and measure), is as near the average of Jersey milk as we can have. The richer the milk is in butter-fat the less its specific gravity."

From these few particulars it will be seen that the Jersey has not only a distinct value in itself but it can be utilised in breeding to raise the butter-fat value of the milk of other breeds. The judicious introduction of a good Jersey bull into a herd of prolific milkers like Holsteins or Ayrshires has been known to raise the quality of the milk with success, for the milk of neither of the latter is nearly so rich in butter-fat as that of the Jersey.—Exchange.

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Dust should be kept out of the milk, for its presence means bacteria in the milk in increased numbers.

BETTER CROPS

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The Value of Milk Records.

To the Editor.

Dear Sir.

The importance to our State of the subject of dairying and value of milk records in connection therewith is leading me to send you the enclosed extract, in the hope that you will reproduce it. I think it fully bears out my contention some years ago that by careful culling and scientific management our dairy industry should show a profit of £10 per cow per annum, and yet only recently I met a man who is struggling along and finding it very hard work to make a milking proposition pay—but he had entirely neglected the question of milk records. If I remember rightly he told me his cows would not average more than 1½ gallons per day.—Yours, etc.,

WM. F. JACOB.

The enclosure is as follows :—

THE VALUE OF MILK RECORDS.

From the Journal of Agriculture, Victoria, July 10, 1911.

By J. S. McFadzean, Senior Dairy Supervisor.

The system of keep records of the milk yield of each cow in the dairy herd, in order that inferior milking stock may be culled out, is gradually gaining favour with dairymen throughout the State; and those following it are unanimous in their opinion of its value. A letter is to hand from a breeder of Holstein cattle, whose milking herd runs well over 150 head. In referring to his records, which have been for years past estimated from one day's milking per cow per month, he says that he is now taking records weekly, and intends to continue on this method for the future. This is sufficient to show that the work is proving highly satisfactory to him.

Some interesting figures have also been received from Mr. F. J. Stansmore, of "Yalart," Pomborneit, in connection with the recording of the work of each of his cows during the past year.

Out of a total of 141 head :—

				gallons.	
19	cows	gave	approximately	300	each
9	,,	,,	,,	350	,,
10	,,	,,	,,	400	,,
16	,,	,,	,,	450	,,
10	,,	,,	,,	500	,,
21	,,	,,	,,	550	,,
29	,,	,,	,,	600	,,
11	,,	,,	,,	650	,,
6	,,	,,	,,	700	,,
7	,,	,,	,,	750	,,
2	,,	,,	,,	800	,,
1	,,	,,	,,	900	,,

The above trials were for a term of 12 months.

As showing the wide variation that does occur among dairy cows these figures are worth studying by every dairy farmer; but, to the owner of the herd, they are of the highest importance. Through keeping tally of each cow's milk for one year, he is now in a position to cull out many which show little profit over the cost of handling them. He can thus reduce his working expenses, and proportionately increase his average return per cow.

The total of milk delivered at the factory from the 141 cows during the year was a trifle over 76,000 gallons; or an average of 539 gallons per cow. For a large herd, this is a very fair return, and it is probably fully 150 gallons over the average yield for the State.

The factory milk tests show that only in one month—June—was the butter-fat percentage down to 3.8, the average for the year being a fraction over 4 per cent.

Where labour is hired, the combined cost of grazing and handling a milking herd cannot be set down at less than £5 10/- per cow a year.

Allowing 10d. per lb. for butter fat the year through, and 1d. per gallon for skim milk for pig fat-tening, there are in this herd :—

cows.							
19	which	profit	£	12	6	each	per yea
9	,,	,,	£1	12	11		,,
10	,,	,,	£2	13	4		,,
16	,,	,,	£3	13	9		,,

If each lot of cows averaging be-low 500 gallons were culled out, beginning with those at 300 gallons, note the possible increase i gallons and profit per cow for the herd :—

	No. of cows	gals.	Profit pe cow per annum. £ s. d
cows. gals.			
Present herd ...	141	539	5 10
Less 19 at 300 ...	122	552	5 15
,, 9 ,, 350 ...	113	568	6 2
,, 10 ,, 400 ...	103	585	6 8 1
,, 16 ,, 450 ...	87	609	6 13

In other words, the 54 poo cows yielded an average o under 400 gallons, whilst the 8 cows give an average of over 60 gallons. The total profit on the basis quoted works out at £77 per year of which the 54 poo cows contribute £112, a little over £2 per cow, leaving the 87 good cows to make up the balance o £663 or roughly, just over £7 10 per head. Again, if the poor cows were equal to the good cows th total profit would be just o £1,075, instead of £775, practical-ly a clear addition of £300 a yea income without adding to any ex-tent to labour, feed, acreage, o plant. Surely no more conclusive answer is needed to the question Does it pay to be up-to-date i dairy practice by keeping records and culling the herd? It is a lit-tle interesting to note that if th 141 cows were all equal to th one 900-gallon cow the profit cheque from the herd would, o the same basis, be £2,731 17/6.— Ed. G. & F.)

ANOTHER ILLUSTRATION.

As further evidence of the great importance of this matter, we find the following report by Mr. F. Graham, Queensland Government Dairy Expert, of the first six

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months of the herd-testing, as inaugurated by the Department of Agriculture and Stock, in the July issue of the Agricultural Journal of that State :—

The work was commenced among the dairies in portion of the West Moreton district in October last, and in that locality 148 dairymen submitted their herds for testing in accordance with the conditions stipulated by this Department.

Number of milch cows submitted for testing is shown as ...	3,475
Number of composite milk samples tested is shown as ...	4,430
	lb. per cow
Highest average yield of milk per diem for a herd ...	26.4
The lowest „ „ ...	5.4
Average	15.2
Highest average yield of commercial butter per diem for a herd	1.08
The lowest „ „ ...	0.28
Average	0.66
	per cent. butter fat.
Highest average butter fat contests of milk of a herd ...	5.1
The lowest „ „ ...	3.2
Average	3.9

In comparing the earning capacity of the most and least satisfactory herd it will be seen that, taking the herds of, say, thirty cows each, and commercial butter at an average price of 9d. per lb. for the six months, the best herd earns £218 14/- gross, and the indifferent herd earns £63, while the average herd earns £133.

In other words, the best herd's earnings are over 10 per cent. greater than the earnings of the average and least remunerative herds taken together.

If the comparison was extended over a full period of lactation the disparity in the earning power of the best and worst herd would be infinitely greater, but I have made a comparison over a period agreeing with the length of the herd-testing operations.

A glance at these early results of herd-testing cannot other than impress dairymen of the fallacy of utilising animals of low productive qualifications.

The best herds can be further improved and made more productive, while the herds below them in productiveness should be promptly "culled," and the general standard of productiveness materially increased.

The pure-bred sire, descended from a family noted for its deep milking and high productive qualities, should certainly be brought into greater demand and prominence by the early results that have reached light by the work of the herd-testing officer.

As regards feeding of the dairy herds, the herd-testing officer's notes show that in the majority of cases the milch cows were grazed on natural pastures. Some herds had access to lucerne fields for portion of the day, while a limited number of dairymen fed their stock on imphee, sorghum, green maize, or panicum. Generally, dairymen are not providing green fodder for the milking herds, nor do they adopt the silo as a means of fodder conservation.

Needless to add that, in instances where special care is taken in the feeding of the stock, a reponse from the cows in the milk yields is noticeable.

The practice of rugging the dairy herds for the colder months of the year remains neglected by the dairy farmers.

The work of the herd-testing officers does not end at the testing of the milk of the herds for the butter-fat contents ; in addition, an analysis of the milks in the various districts is made, and the percentage of solids-not-fat in the milks is ascertained.

The average solids-not-fat contained in the milk analysed are well over the standard of 8.5 per cent., and of ninety-one samples of milk analysed eighty-four samples were higher or equal to the above standard, and seven samples were just under the standard ; the lowest solids-not-fat content of the samples analysed being 8.2 per cent., while the average solids-not-fat of the whole of the milks treated is shown as 9.2 per cent.

It is, however, worthy of mention that the milks analysed were produced during the period extending over October to April, and when natural fodders were plentiful ; therefore it would not be surprising to see later some diminution in the percentage of solids-not-fat that may be contained in the milks, particularly as the non-fatty solids are greatly influenced by the amount and nature of the available fodders for the milch cows during the time the samples are taken for analysis.

Tempering Tools.

Every workman should know how to properly temper the points of the implements and tools which are required in connection with his daily operations. The following information, published by Mr. A. H. E. McDonald in The New South Wales Agricultural Gazette should therefore prove acceptable and useful. Temper in rough tools, he explains, is generally obtained by heating the steel and then cooling in cold water. If the temperature is too low the steel will be left soft, with a coarse grain, while if it is heated too much the steel will be brittle, and will probably have a coarse grain. The cooling always plays an important part. If it is too rapid the steel will be very hard, while if it is too slow it will be soft. To get a good temper the temperature must be right, and the cooling must be done properly. This is a matter of some difficulty, and a little practice is required. It is better not to cool off too rapidly, because if the temper does happen to be a bit soft, it is a simple matter to temper again, but if the tool is made too hard and used, it will probably break at once. The following method is generally adopted in tempering picks, mattocks, and cold chisels :—A dull heat is obtained, and the tool is chilled by immersing about ½ to 1 in. of the point in cold water for three or four seconds. It should be kept moving in the water. It is then withdrawn, and in a moment a pale straw colour should come into the point. After this a dark blue comes, and finally this turns into a pale blue. This pale blue colour must be waited for. Each colour is quite distinct. If the pale blue does not come the tool will be too hard, while if it passes off quickly the tool will be too soft. After the pale blue comes the tool is dipped in water and cooled right out. After tempering in this way the tool should be so hard that the file just grips it.

The more angry you are over some one's aggravating act, the more firmly try not to speak a word for two hours ; then say : "Oh, well ! what's the difference? "

The minimum profit at which a dairy farmer can afford to work his cows is a matter for each to compute according to his acreage and the labour he has to employ. There are many dairymen at present trying to make a living from cows that do not average more than 300 gallons a year. They do not cull, and, when they say there is no profit in cows, they are, under their system of working, coming close to the truth.

The Liming of Soils.

The application of lime to the soil is probably one of the oldest methods of treatment employed in agriculture. It was apparently employed by the Romans 2,000 years ago. In various European countries it has been for many years past, and is still practised extensively. In fact in all countries where the principles of agriculture are scientifically practised it is recognised that the use of lime in various forms may be of immense benefit to the soil.

The description of the action of lime may be given under various heads, viz. : 1, Direct manurial action ; 2, chemical action on soils; 3, physical effects ; 4, effect on soil bacteria.

— Direct Manurial Action. —

It is of course recognised that lime is necessary to plant life. It is present in the ashes of plants, and appears to be an essential constituent of their substance. What part it plays is not exactly known, but it is believed that it assists in the conversion of starches into cellulose in the plant structure.

Authorities differ as to the actual amount of lime which should be present in a soil, but it is believed by many that if only .5 per cent. is found the soil is in need of immediate liming.

Lime is particularly likely to be wanting in soils derived from granite. Even soils of limestone origin may be benefited by the application of lime. They may be so charged with inert organic matter or so acid that the profitable production of crops is impossible.

— Chemical Action on Soils. —

1. Lime is said to take the place of potash in certain chemical compounds which exist in soils and which are of such a character that plants cannot make use of the potash they contain. Thus lime may be of great service in liberating the potash and placing it at the disposal of plants.

2. When soluble phosphates (superphosphates) are applied to lands deficient in lime and magnesia, the phosphoric acid combines with the iron and alumina of the soil to form compounds which are not readily utilised by plants. If, however, the soil is well limed, this change is retarded, so that the plant can make use of the phosphoric acid before it assumes a less assmilable form. If, on the other hand, inert forms of phosphates are already in the soil, the application of lime is believed to convert them into available forms.

3. The value of lime on "alkali" soils has been conclusively and abundantly illustrated in America. The black alkali (sodium carbonate) is converted by the application of gypsum (sulphate of lime) into sodium sulphate with the simultaneous formation of carbonate of lime, whereby the alkalinity is so far reduced as to render possible the profitable production of crops.

4. The production of acid or sour humus is a common occurrence in soils where there has been much decay of organic matter and a deficiency of carbonate of lime. This is very common in black swamp soils, so much utilised for gardening, etc., and often occurs in upland soils of a sandy nature and well drained. Indeed, I have been much struck by the large number of soils of a sandy description, examined in my laboratory, which have a marked acidity. This acidity is very noxious to most agricultural plants, and an effective and economical remedy is the application of lime, which will neutralise the acidity. This also promotes the production of carbonic acid, which in turn acts upon the plant foods of the soil, rendering them more quickly available to plants.

— Physical Effects of Liming. —

The addition of lime to clay soils has the following beneficial effects :—

(a) Soils which in wet weather become water-logged through lack of porosity and then become insufficiently aerated for the proper development of the root system of plants, are opened up and rendered more porous.

(b) The caking to which such soils are liable in drought is also prevented.

(c) The surface of the soils is rendered more friable and lends itself better to tillage.

(d) Through the improvement of drainage thus induced surface washing is prevented.

It is of value in the opposite direction with soils composed of silicious sand, as it is said to render these more compact. In this case, however, it is best to add a clay marl to the soil, containing a fair amount of carbonate of lime. The clay as well as the lime then tends to improve the physical quality of the soil.

— Effect on Soil Bacteria. —

There are two great processes going on continually in the soil, which are now known to be due to the activities of bacteria, viz. :—

(a) The conversion of ammonia and other compounds containing nitrogen, derived from decaying organic matter and nitrogenous fertilisers, into nitrates, the only

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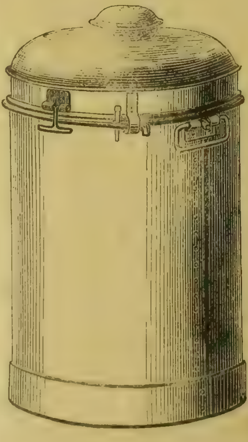

rm in which (it is believed) ants can utilise the nitrogen.

(b) The utilisation of free nitron of the atmosphere by leguminis plants.

Both these processes (especially sour soils) would appear to be eatly facilitated by the applicaon of lime.

Liming Sometimes Injurious. —

The dangers to be avoided in ing lime are thus described in the lletin already quoted :—

" Excessive amounts of lime, pecially on light soils, may have injurious action. This is parcularly true of freshly slaked ne upon light sandy soils coniing but small amounts of ornic matter. It hastens unduly e decomposition of the organic atter, and thus renders the soil ore open and less retentive of tilisers and moisture than bere. If freshly slaked lime must used upon such soils it should applied in small amounts and not too frequent intervals. As ated heretofore, clay marls are ich better adapted than other rms of lime for the improvement such soils. In lieu of such arl, wood ashes or lime which s been exposed to the action of e air for a long time, might be eferable to lime freshly prepared.

" Before the advent of complete tilisers it was a common adage at 'liming makes rich fathers d poor sons.' If lime is used one it serves to liberate potash, trogen, and perhaps sometimes osphoric acid, and the extra ain of increased crops on the il naturally leaves it finally in a orse condition than at the outt. In other cases the soil rerts after many years to its forr state of unproductiveness thout appreciable injury. Conued success can only be obtained the use of the other essential anurial fertilising constituents in nnection with the lime. Few, if v, cases are on record where the ils originally in need of lime ve failed to continue to give od results from liming when care s taken to maintain a supply the other essential constituents d where lime was applied in oderate amounts.

'Dolomitic (magnesian) limeone contains widely varying perntages of lime. Such stone, containing high percentages of agnesia, may sometimes prove jectionable if used exclusively. ien such material is applied to ils the lime is removed by crops d the drainage water more pidly than the magnesia, and if the lime thus becomes practically exhausted the residual magnesia in the soil may have an injurious action. This can, however, be overcome by adding more lime. Rather than use such lime for long periods of years on the same land, it would be preferable to alternate frequently with lime containing little or no magnesia.

" Some magnesia in lime is by no means objectionable, and may, on certain soils, prove positively beneficial."

—Plants Benefited or Otherwise.—

The following three lists of plants are given with which tests were made at the Rhode Island Experiment Station. Many of the plants are unknown to us here, but are all quoted to show the relative proportions of those benefited or injured :—

Group 1.—Plants benefited by liming.—Spinach, Lettuce, Beets, Gumbo, Salsify, Celery, Onion, Parsnip, Cauliflower, Cucumber, Sorghum, Clover, Wheat, Timothy grass, Oats, Egg plant, Cautaluope, Asparagus, Kohl-rabi, Cabbage, Dandelion, Swedish turnip, Pepper, Pea, Peanut, Martynia, Tobacco, Alfalfa (lucerne), Barley, Kentucky Blue grass.

Group 2.—Plants injured by liming.—Serradella, Water melon, Blue lupine, Sorrel.

Group 3.—Plants nearly indifferent.—Indian Corn, Common millet, Hungarian millet, Golden millet, Rye, Potatoes, Carrots, Rhode Island bent grass, Red top grass.

In the first group not only was the crop greater, but in many instances was earlier when the soil was limed. Even the plants in the third group were benefited by lime on very acid or sour soil.

Potato scab, " Club Root " in turnips, cabbage, etc., and other plant diseases are said to be greatly lessened by the use of lime.

— Forms of Lime Used. —

There are many forms of lime which can be used and are used for agricultural purposes.

Carbonate of Lime.—(Limestone, chalk—contained also in varying portions in Marls).

Caustic Lime (" quick " or " burnt " lime)—This is the most economical form in which lime can be bought when long transport is necessary—it contains up to about 95 per cent. of actual lime. Sometimes it contains considerable magnesia, as mentioned above. A ton of limestone converted into quicklime yields 1,100 to 1,200lbs. Hence it is economy to burn where the stones are quarried.

When slaked it takes up considerable water, and a ton of lime becomes about one and one-third tons of slaked. Hence it is economy to slake on the ground where it is to be used.

Which of these forms of lime is best to use, depends chiefly on the price at which they can be supplied. Where a soil is seriously deficient in lime gypsum may act as a direct manure, its chief benefit, however, is generally attributed to its action on potash salts, as already described. In modifying the physical characters of clayey soils, slaked lime or the carbonate is said to be more efficacious than gypsum, but the latter is claimed to be the best for liberating potash—the former are best for correcting acidity. In the treatment of alkali lands, however, gypsum cannot be replaced by any of the other forms of lime.

Owing to the fact that gypsum contains only about one-third as

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much lime as quick lime, it is at a disadvantage for most purposes for which lime is applied to land, unless, of course, exceptional circumstances render it possible to sell it at a correspondingly low price.

Phosphate of Lime occurs as bone, guano, and phosphate rocks.

Superphosphates, which are prepared by treating phosphatic rock with sulphuric acid, generally have about one-third of their lime combined with phosphoric acid, and two-thirds with sulphuric acid. That which is combined with sulphuric is simply gypsum. For this reason (see above) superphosphates frequently do not work as well on acid soils as ordinary undissolved phosphates or bone, and they may even exert an injurious action on such soils if they are naturally deficient in lime.

Basic Slag (Thomas's Phosphates) also contains a considerable amount of lime in its composition, more, indeed, than the ordinary high grade phosphates, and does not have the injurious effects of superphosphates. It is, therefore, of special value for acid soils, especially those rich in organic matter, like swamp soils.

Wood Ashes contain a large amount of lime in the form of carbonate, varying, of course, with the wood from which they are derived. It is probable that the ashes obtained from the waste of our large timber mills might be turned to profitable account on our soils, but this will, of course, be governed by their lime content and cost of transport. In reckoning their value, however, consideration must be given to the valuable carbonate of potash which they also contain.

(To be Continued).

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Breaking Colts.

Breaking a young colt is, as a rule, a very vexing and often a very costly job, especially if the colt is one of the kind that believes in kicking, backing, jumping, and running away as soon as hitched up. A farmer can easily provide for the breaking of such colts as follows :—Go to the woods and cut down two saplings from 12 to 14 feet in length, to be used as shafts. The saplings should be so strong that there will be no danger of the colt breaking them. Then remove the hind trucks from an ordinary farm wagon, leaving the coupling-pole remaining on the front trucks. Now take two [illegible] x 4 scantlings from 3 to 3½ft. long, and bore an inch auger hole through the centre of each. Now lay the two saplings on the ground in the shape that you wish them to be when in use, except that the back ends must be just far enough apart that they will fit up against the standards at the sides of the bolster. Next take two scantlings and nail one on top and one underneath the shafts, about 4 feet from the back end of the shafts. In doing this you must watch to see that you get the auger hole centrally between the two shafts. After you have done this place the back end of the shafts on the bolster between the standards, and put the front end of the hounds between the two scantlings, and secure it by putting a bolt through the auger hole. A board about 6 in. wide and 3½ft. long, with notches cut in the ends for the standards to fit in, should now be nailed over the back end of the shafts, after which they may be s
curely fastened by tying them
the bolster. For a seat you c
take a strong board, fasten it
the scantlings, and let it exte
back over the bolster a couple
feet, and you will not only have
seat, but a comfortable spri
seat. The thing is now comple
When you hitch up the colt a
take your seat behind it, you c
realize that if it goes to kicking
will have nothing to kick; if
goes to backing it will not have
buggy to cramp and upset, and
it should run away it will
hitched to something that w
not be smashed to pieces by t
first thing it runs against. Aft
you have finished breaking yo
colt you can remove the shaft
for that is all they are, from t
wagon trucks, and lay them aw
to await the time when you sh
have another colt to break.
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Horse-Breeding Societies.

The question of the maintenance nd improvement of the horse ock of the State is one of the tmost importance, for The Age Petrol, as far as farm work is ncerned, is not yet. It is also e which admirably lends itself to e co-operative idea. Under esent conditions the improved orse breeding proposition is ra er too big a matter for the aver ge individual farmer to grapple ith, and he is consequently very uch at the mercy of chance as the quality of his foalings. here are some very excellent sires ationed in various districts of the tate, but equally there are no oubt a number which have little aim to be so classed. That is condition exists is probably a large extent due to the lack knowledge or worse, the short ghted policy of farmers generally ho have been too inclined to eigh shillings in the service fee gainst pounds in the value of the al, for there to be much encour gement for investment in stock the highest quality by owners travelling sires, who have na rally come to the conclusion at when a 50-guinea sire could rn practically as much as a 50-guinea animal it would be folly procure the better class horse.

In the past Spavin has been al wed to cover String halt and so egotten Nightmare far too fre uently, for the well-being of the orse industry of the State, ough the tendency has no doubt een, in the last few years of pros erity, towards a much improved rade. Still, left to individual fort progress must be slow for e owner of one, two, or ten orking mares even if convinced at only the best was good ough for his use, may with some ow of reason prefer to employ e second class travelling sire to aying a big figure for a first ass animal for which he would ave little use himself and whose asonable service fee for local ares might be undercut by the wners of "travellers." This being any farmer so placed should, and e believe, will welcome the privi ge of paying a guinea or so as insurance premium by which he ssures to himself the opportunity using a horse in the selection of hich he, as one of a number, has ad a voice and in which he has a ersonal if small interest. It is is opportunity which the scheme r the establishment of subsidized orse Breeding Societies recently tlined by the Director of Agriculture and approved by the Government makes available for any district in which the required number of farmers (the minimum is 20) or owners of brood mares, take the necessary steps to form themselves into a society on the lines set out in the regulations which have been framed, copies of which will be forwarded to anyone interested. Farmers in each district will naturally look to the local Bureau to make known the details of the contemplated arrangements by which subsidies will be made available. In many cases, no doubt, Bureau members will, at all events, form the nucleus of district societies, but the proposed organizations will be entirely apart from the Bureaux and it is open to anyone as representing a body of farmers and owners to take the necessary steps to form a society—Professor Lowrie will no doubt be pleased to forward the fullest particulars or advise any enquirers on any point which may not be understood. We have been favoured with copies of proposed constitution, rules, regulations, etc., as well as of examples of financial results under various conditions, and the scheme outlined therein appears to us, as we believe it will, to all persons interested, to be simple, practical and eminently helpful in furthering the cause of improved horse breeding.

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Profit and Loss.

Any branch of farming which increases the general fertility of the farm land, while paying a living profit, is worth more than another which steadily decreases the productivity of the soil. Robbing the land to make present profit is an unwise investment. Sooner or later we pay for it, and sometimes dearly. Now dairying, of all branches of farming, stands first in this respect. It can be conducted so that the farm land will steadily degenerate until the place is on the verge of ruin and abandonement, or it can be made to improve the soil year by year. Many a dairy farmer has taken hold of poor abandoned farms and brought them up to a point where their valuation is almost doubled. Such men counted their profits in the living which they annually took from the place and in the higher valuation of their property. Keep a good dairy on any farm, and the fertility of it should increase. In order to bring up a poor farm by dairying, care should be taken not to have more stock than the land can afford. This is often the weak point in dairying. A man keeps fifty cows on a farm able to support only thirty or forty. The farm is bound to run down. There is nothing else for it to do, except to starve the stock or buy outside food, which always means poor economy. It is better to sell off the stock, weed out the poorest of the herd, and keep only so many as the farm can support, and leave a little something over. Do not farm up to the very limit of the soil. That is, do not take off each year quite all that the land will produce. Leave a little balance in the bank as a nucleus for future accumulation. Dairymen make this mistake and regret it when it is too late. As one succeeds in farming successfully with one hundred acres, keeping a herd of cows on it so that they have ample to eat and a little surplus over, more can be brought under cultivation and the stock increased. About half the dairy farms to-day need to have either the herd cut in two or half the land abandoned. That is, the former are raising too many cows to the acre, and robbing the soil, so that the farm is a little poorer each year, and the latter are only cultivating about twice as much land as they are capable of handling with their limited means. It is better to seed half the land to grass, and let it go at that, and devote the attention to strenuous cultivation of the remainder. A little radical change like this will work wonders on many a run-down dairy farm.

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Breaking-In Young Horses.

Experienced horse owners appreciate the value of handling, leading and controlling generally their foals from an early age. while others leave the handling of colts to the day when breaking is commenced. A moment's consideration will show which is the better course. In the one case confidence has long been established between horse and man. The horse, while recognising that he must submit to control, knows that the new experiences which come his way are not likely to do him any harm. In the other case the horse knows nothing. His natural tendency is to regard any measures taken for his control as so many elements of danger to be avoided as far as possible, and to be resisted strenuously.

Satisfactory horses may be produced by either of these systems; but horses are very easily spoiled either by not having their wilful ways curbed or by being soured by excessively severe treatment. The average man does not make allowance for want of intelligence in the horse; he does not appreciate the fact that the horse does not know the meaning of the human language; he does not know that the stupidity of the horse is due to his own defective methods. Horses may be spoiled by either system, but fewer horses are spoiled by kindness than over-severity.

The age at which horses may commence to work, is not less than two years old. The principal objections to working horses too young are the probability of strains to the sinews and muscles, injuries to the joints, particularly hocks and fetlocks, and the growth of splints and sidebones. Prevention is better than cure even when a cure can be assured, but a real cure for most of the complaints resulting from putting horses to work too early is not to be easily had.

When breaking-in commences, many owners of horses allow the young horse to be put on low diet, so as to keep down the high spirits, and assure that he will not be able to get the upper hand of the breaker. This is the wrong course. Breaking-in is a severe ordeal to a young horse that has not been accustomed to control, and the horse will certainly not take kindly to work if his spirit is broken by starvation. The average young horse is quite easily induced to submit to the wishes of man if those wishes are expressed in a way that the horse understands. It is after he has been knocked and bullied that he becomes obstinate.—Exchange.

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The Feeding Value of Molasses.

Professor Thomas Shaw, the great live-stock expert, says on this subject in his book, "Feeding Farm Animals":—"Molasses is a product obtained in the manufacture of sugar from cane and also from beets. Formerly much of this valuable feeding product was wasted, but during recent years its real worth is coming to be more generally understood. As the sugar-beet industry increases, so will the use of this by-product in feeding increase, consequently, it would not be possible at the present time to forecast the extent to which it may be used in feeding live stock. Its highest use is found in feeding horses at work and in fattening cattle and sheep; but it has also proved helpful in feeding in certain combinations for milk-production.

"The real value of molasses in feeding is greater than chemical analysis assigns to it, since when mixed with other foods it adds to the palatability and so increases consumption. It is probable that henceforth nearly all the molasses made at sugar-beet factories will be mixed with the pressed pulp and dried before it is put upon the market. The product thus prepared is ready for feeding by simply mixing it with other foods or adding it to them dry, but more commonly with all the water added that it will absorb. The objection to feeding a substance so sticky as liquid molasses poured over the feed is thus avoided, more or less of which adheres to the feed boxes and in summer attracts many flies.

"For cattle, molasses is being used in increasing quantities. Mixed with dried blood, it aids development in calves that are being prepared for the block. They furnish an excellent complement to such food as cotten seed meal when fed to cattle that are being fattened. The product has been much used in preparing animals for exhibition. It has thus led to increased consumption of the other food and improved the gloss of the coat. It is commonly poured over meal, or, what is better, over meal and cut fodders mixed. It is frequently diluted with water before thus mixing it. As a food for milk-production, it is fed in smaller quantities. Dried molasses beet-pulp may yet be used extensively as a supplementary food for dairy cows summer and winter.

Until more light has been obtained, however, as to its influence on the breeding properties of animals, it should be fed with prudent caution, more especially to young animals intended for breeding.

"In feeding sheep, molasses has not been much used, but recent experiments at the Michigan Experiment Station have shown that dried molasses beet-pulp had a feeding value for fattening sheep even higher than that of cattle.

"To swine, molasses has been fed successfully along with skim milk. Its use, however, in feeding swine will probably be limited, as an appetizer is less necessary for swine

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than for the other classes of farm animals.

"For horses, molasses is probably more valuable in feeding them when at work than in feeding any other class of farm animals. Not less than two quarts per day of cane molasses may be fed with advantage to work horses and mules for prolonged periods. The molasses is diluted with three times its bulk of water and poured over the morning and evening ration. It is common to feed a little bran along with cane molasses to correct a tendency to constipation, which is said to result from feeding it. It is claimed that it is nutritious, healthful, and economical. It may yet become popular to feed it to horses that are being wintered on products coarse and cheap, and fed in cut form."

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Breeding the Ayrshire.

Since I believe the Ayrshire cow to be as near perfection as possible in size, constitution, ability to assimilate food to the highest degree of profit in dairy product, a strong, healthy, robust cow, it leaves only the outward confirmation to be changed, if desired, which is the easiest of all things to change in breeding (writes the Country Gentleman). The Ayrshire cow is quick to respond to influence of environment, quick to yield to the efforts of the breeder in changing to suit the whim or fancy of her owner. It needs only judicious selection to remedy any defects in her build, and it is not at all necessary to go outside the breed to find perfection in any point desired for change.

We see this in the changes that have been made in her conformation and colour, her style of horn and shape of udder, as well as her length of teat. She adapts herself to the needs of her owner in whatever country she finds her home. If he wants white colour she gives him white calves; if he wants an upright horn it quickly appears in her offspring; if he wants long teats for his men to milk they are provided in her calves, and she just as readily gives short ones for the dairymaid. I have been surprised at the quickness of the change in imported cows in regard to the hide and hair, the skin becoming softer and the hair finer and shorter after being imported for a while owing, no doubt, to the different climate and stable care.

The only point that can be criticised in the Ayrshire cow for utility in the dairy, and for the convenience of the milkman is the teat, and this is easily conformed to the desires of the milker by a skilful breeder, and within the limits of the breed. An intelligent and careful breeder will not place a bull at the head of his herd without carefully informing himself in regard to the female lines of ancestry that lie back of the proposed bull.

No good breeder will use a bull that has a dam with short teats, and if he is wise he will see to it that his bull has a grand-dam with long teats also, and the more careful he is the further back in all the female lines will he investigate. It is not a difficult matter to obtain a bull strongly prepotent in this point, but it requires research and care, exercised most advantageously in personal inspection.

Change of colour from red to white, or from white to red, or change in the shade of red, the shape and style of the horn, are all extremely easy to accomplish, and it can be done in a generation or two by a proper selection of bulls to head the herd, and all within the limits of the thoroughbred Ayrshire cattle.

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Dirty Milk.

The greater part of the impurities found in the milk get there within a short time after it has been drawn from the cow, and before it leaves the shed. In most sheds the air contains, not only a large number of bacteria, but also many kinds of foreign matter. Dirt gets into the milk when in the shed, principally from three sources — from the cows, the milkers, and the air. In a general way, it may be said that the cows supply most of the dirt. Every milking cow should be brushed daily, and the udder and lower parts should be wiped with a damp cloth just before milking for the purpose of moistening the dirt to prevent its falling into the pail during milking. Cattle soon become accustomed to this brushing and wiping, and learn to enjoy it. Sometimes there is a little trouble when the udders are wiped with a cloth, because the cows gets the impression that she is to be milked at that time, and later, when the milker comes along, she refuses to give down her milk as easily as usual. This, however, is only a temporary effect, and wears off in a day or two. Care should be taken not to make the parts too wet, or the excess of water will drip into the pail. They should be only slightly damped. In cases where the cow has a good deal of long hair on the udder, conditions may be improved by having the hair clipped. During the wet season, when cattle are walking around in muddy yards, often with udders rubbing on the ground, it takes considerable water to get them even in fair condition. In this case, after washing, the udder should be rubbed dry with a clean woollen cloth. Cleanliness of the milker is also extremely important. We should insist upon his wearing clean overalls and washing his hands thoroughly just before milking. Every one who has been around dairy-yards is familiar with the too frequent condition of the milkers' overalls; spattered with milk and covered with dirt, they look as though they would stand alone. His hands, too, are generally dirty, and then, too, he moistens them with milk in order to make the cow (as he thinks) milk more easily. The milk softens some of the dirt on his hands, and you can see it oozing out between his fingers and dripping off. These conditions must be removed if we are to have milk of good quality.

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Dairy Notes.

The natural food for the calf is fresh, warm milk, and the milk given it after it is parted from the cow should also be fresh and warm. If skim milk is used there will be a lack of cream, which is important so far as the welfare of the calf is concerned. One who has been successful adds a raw egg, well shaken, with the milk at each meal. Flaxseed meal cooked until a jelly is formed may be used with the milk, a gill at each meal being sufficient at first. Do not overfeed, but give a little milk at a time and often at a temperature of 95 degrees.

Since the discovery of the air treatment for milk fever, it is not necessary to feed the cow lightly several weeks previous to calving, but she may be fed well right up to the time of parturition. Sometimes a heavy feed of luxuriant pasture will stimulate heavy milkers to produce too much milk prior to calving, but such cases are few, and it is usually an animal that is in good condition and does not need to be fed very much. Occasionally some cows have to be milked before they drop their calves, and there should be no hesitancy in so doing when the fullness of the udder indicates that the cow should be milked, for there is danger of ruining the udder if it is not relieved.

Before commencing to milk brush all loose dirt from the sides and udder of the cow. After a little manipulation of the teats and udder the milk is ready to come down and should be taken without delay. Milk as rapidly as possible. No definite rule can be given as to how the teats should be handled in milking, as both cows and hands differ so much, but the milker should strive to please the cow, which a careful observing person can easily do. There should always be a friendly feeling between the cow and the milker, and the milker should not be changed if it can be avoided. A cow will not give down her milk to a person she hates or is afraid of, and what she does will be deficient in butter fat.

Some farmers put more cash into their cows in the shape of feed than they ever get out as milk. Hold your peace now and don't say that it is the fault of having the wrong kind of a cow. Some of you think the sinner who preaches dual purpose cow is at the bottom of all these failures. Maybe he is; we don't know. But we say that it is seldom the fault of the cow. The men who fail to make a profit from the dual purpose or common cow are the men who would likewise fail with the special purpose cow. It is the man and not the cow that makes success or failure. Of course the cow helps. But the right kind of a man naturally has the right kind of a cow—and the cow has nothing to do with choosing the man.—"American Exchange."

Brine salted butter is expensive, because a sufficient quantity of brine should be used to float the butter in the churn, and although this brine may be drawn off and used two or three times, it finally becomes so contaminated by repeated use that it is necessary to throw the brine away. Brine may be made by adding salt to cold water and stirring as long as the water will dissolve salt. As soon as the salt collects in the bottom of the can and no more of it will dissolve, the brine is saturated. The buttermaker ought to be able to dissolve the salt crystals in butter, so that it will not leave a gritty salt in the butter. This can be done by allowing the butter to stand after adding the salt, then work a few times and let stand again, repeating this operation two to four times, and even more if the salt does not dissolve readily.

Buttermilk feeding is said to be most excellent for infants suffering from intestinal indigestion, inflammation, and wasting.

The object in cooling milk is not alone to prevent it from souring, but to retard as well the multiplication of other and more injurious species of bacteria in addition to those which produce the lactic acid.

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Curry-Combing.

In referring to the details of stable management it is impossible to avoid an allusion to the far too prevalent use of the currycomb by some grooms when horses are being dressed. This comb, of course, is useful at times and under certain conditions, and it is always serviceable in assisting to cleanse the body brush; but it ought not to be applied to the coat of the horse as a general rule, and when it is the coat should be combed the right way if possible. Some grooms, however, will ruffle up a whole side of a horse's coat in their efforts to remove any traces of scurf that may appear amongst the hair, oblivious of the fact that the hard teeth of the currycomb are calculated to injure the skin, and therefore to produce still more scurf than they remove. The application of the body brush vigorously, or even a thorough strapping of the body of a horse with a wisp of hay or straw, will do more to improve the condition and appearance of the coat than any amount of currycombing; the real secret of horse-dressing being to take one's time and to do nothing that will interfere with the lay of the coat.

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Fodder Crops.

A most noticeable feature throughout Victoria, and one to which, notwithstanding current conditions of bountiful ease, many of our stock-raisers and farmers could advantageously pay more attention, is the increased cultivation of fodder crops. A policy of this nature has been pronounced a wise one over all the grasslands of that State since the dry season of 1902 and the years immediately preceding it. Although, as a whole, one cannot compare the grass lands of this State, for natural fertility and area, with those of Victoria, we have a sufficient acreage of specially adaptable lands in the South, South East, and Lower North to profit by wise examples set in this direction over the border, writes "Elder's Review." Almost every grazier and farmer knows by past experience, even in good seasons, that natural pastures are of a most volatile character when a dry stretch happens along. Under-stocking has proved the great protection, in the absence of those hardy saline bushes which are so helpful in drier regions. The man who has systematically understocked of late years has not been able to crow over his more happy-go-lucky neighbour quite as much as he anticipated. The indications are not lacking—certainly over the border—that the happy-go-lucky, trust-to-rain-or-Providence order may emerge the more triumphant of the two. Whereas he could never suffer to see good grass go to waste, and felt bound to stock up to meet the growth, he is now entering with dashing enthusiasm into the campaign of raising fodder crops. At the present rate of increase, the practice of growing fodder crops on holdings in Victoria where stock are kept promises to become so general as to absorb both the cautious and the happy-go-lucky in one and the same cause. That serious loss of stock in dry periods will then be minimized goes without saying, as well also as another result: the stock-carrying capacity of the whole State will be greatly enhanced.

Lucerne, instead of being sown alone on specially-prepared land, is now put in with a cover crop, the more popular aid being wheat. The soil requires to be well worked, and brought to a fine tilth, and cleared of weeds. A heavy dressing of superphosphate, from 75lb. to 100lb., is advisable with this and all other fodder crops. If drilled in, 6 or 7lb. per acre is a fair seeding, but for broadcast purposes at least double that quantity is necessary.

Prairie grass is a good winter grass, but if depastured upon continuously it will soon die out. All stock are inordinately fond of it, and the plant should therefore be well fenced in, fed down rapidly in small paddocks, and periodically rested. Prairie grass mixed with lucerne has been proved a huge success at the Werribe (Vic.) Sewwage Farm, for fattening sheep. On that farm there are 3,000 acres thus planted, and the success of this experiment on so big a scale has created a perfect furore among graziers.

With clovers one is not very familiar in this State, but with cocksfoot a more than passing acquaintance can be claimed; it has become well established about Dashwood's Gully, and is particularly suitable to all the hill districts. Sheep's burnet is becoming popular in the South, some experiments having been made there on a fairly big scale. Yorkshire Fog—which is regarded as a weed in New Zealand—has caught on well about Strathalbyn. It shares minor honours with ribbon grass. Of all fodder crops in this State none has yet proved itself to be more valuable than rape. Great results in the fattening of ewes and lambs have been obtained locally on rape. It is the crop of all especially adapted to the export lamb-trade. Lambs, when turned thereon with their mothers, wean themselves without losing any condition at all. Victorian evidence supports the great value of this crop. Land in the Western District carrving only a sheep to the acre under natural conditions has fattened eight to ten sheep to the acre during the spring, when put under rape. Further evidence in support of rape as the best of all these crops is furnished by its efficacy as a good soil renovator. Its deep tap-toot opens up the subsoil, and allows it to be properly aerated. Some farmers are prejudiced against the risks of "bloat" for sheep turned suddenly on to rape. The remedy against this lies in mixing half a pound of white mustard seed to every 3½ pounds of rape.

Numerous varieties of sorghum, maize, and Japanese millet make succulent feed in autumn. In the early stages of growth some of the tribe are injurious to cattle, and care should be taken not to feed any of the sorghum family until the seed-head has shot out. From the middle of September to the middle of October is pronounced by a contributor to the Argus to be the best time for sowing. He recommends from 6lb. to 8lb. of seed drilled, and 12lb. to 14lb. broadcast.

One of the most valuable fodder plants, especially as a drought-resister, is one with which Northern sheep farmers are most familiar—the saltbush. Some varieties can be cultivated, and have caught-on greatly in California. Saltbush will grow anywhere, and need not necessarily devote its special virtues to dry latitudes. The only care required in its cultivation is to see that stock do not treat it in the same fashion as has been done in the North, and eat it out.

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Breeding from Fillies.

The subject of the age at which mares should be put to the horse is one of very considerable importance. It is held by some, mostly those in a hurry, that it is advisable, or, at least, not in any way harmful, to breed from two-year-old fillies where they are allowed to run and are not broken for work.

In our opinion, writes "The New Zealand Farmer," the breeding from two-year-olds is a bad practice, for it is too much to expect young animals to grow themselves and to properly nourish a foetus at the same time, while there is subsequently the long period of lactation during which there is a further drag. The general result is that the filly is stunted in her growth, often has a bad time at foaling, and produces a poor, weedy foal as well.

We are often pointed to examples of prize-winners that have been produced by two-year-old fillies, but we have in mind the breeding of the commercial animal —a horse for work, not for show—and even among horses of this class, where one animal, of which we hear a great deal, is a success, there are many weedy failures of which we hear nothing.

There may be much to be urged in defence of breeding from immature cattle, sheep, and pigs; but these animals are not kept for work, but for the production of meat and milk, and "early maturity" is, of course, a point of great importance so far as this class of stock is concerned. They are not wanted to last, but to grow and fatten quickly, while the horse is bred for work, and work alone.

What sort of stock can be expected from baby mares, or what kind of foal can an animal produce which has not yet completed its own growth? We depreciate early marriages, and preach that maturity is desirable for maternity in the human subject, and yet violate the principle where our animals are concerned.

The best workers among horses are undoubtedly bred from animals that are workers themselves. Some years ago, Mr. Alex. Morton, in a paper on horse breeding, urged that animals which had been conditioned by hard work should alone be used for breeding, and his remarks have an important bearing on the question of breeding from immature mares. He said: "A race of horse, like a race of men, will not endure long years of constant hard work without developing qualities to cope with and overcome these necessities; and the fact that for hundreds of years the Hackney has had to do all the hard road journeying, and to do it cleverly, has developed in this breed a quality of nerve, a firmness of muscle and sinew, a hardness of hoof, and formation of foot, leg, and body generally which no horse without a similar past experience can possess, and which, in fact, I contend gives the Hackney the claim to be called the horse of the greatest pluck and of the vastest staying powers in the world.

It is a remarkable fact that all the most famous sires are the progeny not of mares always kept exclusively for breeding, but of mares which have had to do the work of an ordinary horse, and thereby developed lots of muscle and power.

It is noteworthy, too, that sires produce better stock after several years of hard exercise, and these facts are most important to observe when collecting stock for breeding purposes.

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Feeding the Horse.

Mr. J. H. Grisdale (of the Canada Experimental Farm) writes:—"The horse knows when it is mealtime, just as well as a man with his watch to look at. He can tell the minute when he should be fed. Give the morning meal about an hour before going out, but an hour and a half is somewhat better. At noon half an hour is sufficient if necessary, but an hour is better. Then in the evening, of course, they have lots of time at their disposal. As to the watering, it is better to give them water about 15 minutes before the grain or hay is fed, and in the evening again after they have their meal and hay. About two hours after feeding they should have all the water they will take. It is advisable to give a horse water whenever he needs it, or cares for it, a small amount at a time. They will require a considerable amount in a day, from 60 to 70lbs., according to the weather and the work they are doing. The amount of material to feed daily is gauged by the size of the horse, and a very safe rule is 1lb. of hay and as much meal for each 100lbs. that a horse weighs. If the horse is working very hard it is necessary sometimes to change the proportion to, say, ¾lb. of hay and 1¼lb. of meal for each 100lbs. of the horse's weight. The method of feeding will depend somewhat on the work the horse is doing. We find a good plan is a small amount of hay, perhaps one-fifth or one-sixth of the daily ration of hay and one-third of the meal in the morning, and about the same at noon. This leaves about three-fifths or three-fourths of the hay for the night feed, and only one-third of the meal. This gives the best results, as the horses are able to fill themselves at night and store up a stock of energy for the next day's work. One important point which is quite frequently neglected or overlooked is the allowing of any food to remain before the horses after they are through eating, after they are satisfied. That is a point where many farmers make a great mistake in putting in a lot of hay, and saying: 'They will eat what they like.' A horse does not like fodder that has been breathed upon, and will not eat it with the same zest as he would under other conditions.

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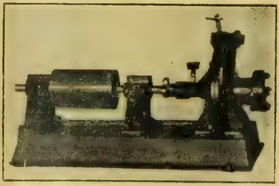
The best class of horses for farmers to produce generally is the draft horse. To produce him it is expedient that the breeder knows what constitutes a desirable draft horse. He is an animal standing sixteen hands and over. He should be well proportioned in every part, his action straight and springy, quality fine, free from unsoundness and of kind disposition in and out of harness.



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Broom Millet.

The total import of the products of Broom Millet into the Commonwealth is very considerable, for the total area under this crop is not much more than 2,000 acres, by far the greater part of this being in New South Wales. As millet will thrive wherever maize grows, and is a more profitable crop, it is a matter of surprise that Australia still has to import the bulk of her supplies. Given certain conditions it is a fairly certain crop to grow and has the further advantage that it is not as costly to harvest as some high priced products and can be stored for a considerable time, if ruling prices are unfavourable at time of harvesting. A reasonable return may be put down at over half a ton of brush to the acre, worth from £20 to £35 per ton, whilst for feeding purposes on the farm the seed is estimated to be worth 20/- to 30/- per acre. The demand for local use is not very extensive nor can it be expected to increase to any great extent, at the same time there is room for a very great deal more than is at psesent grown in South Australia. Last year Mr. Hendrey, of the Royal Institution for the Blind, distributed a small amount of seed from which extremely satisfactory returns were obtained. The quality of the brush comparing very favourably with the best grades of imported. In New South Wales it is now considered one of the well established minor industries, though the average quality of the product is said to be capable of great improvement. In this as in other crops it pays best to grow the best and there appears to be very little doubt that the irrigation areas along the Murray are admirably adapted for doing this, though its profitable cultivation is by no means confined to that particular portion of the State, for Mr. Hendry has been able to pay at the rate of £26 per ton for a small parcel of brush grown last year at Clare. In Farmers' Bulletin, No. 20, "Broom Millet," by Mr. G. Marks, Instructor of Agriculture, at Hawkesbury College, after referring to the necessity of knowledge of the requirements of the crop, it is stated that "those growers whose practical knowledge teaches them to produce only the very best are handsomely repaid for their outlay." It is from this source that we print the following instructive extracts as to its cultivation :—

— Class of Land Required. —

The soil requirements of broom millet are similar to those of maize. The best results are obtained from the deep, rich, well-drained alluvial lands of our rivers. It is, however, capable of adapting itself to a variety of conditions, and, with proper care and attention, sandy and even gravelly soils, if thoroughly drained, will produce fair returns. Undrained lands make the working and cultivation more difficult ; the growth is generally slow and uneven, and there is always the liability of the crop becoming stunted and diseased. To ensure evenness in ripening a soil uniform in character and fertility is essential.

— Preparation of the Land. —

To obtain the best results, the land must be properly prepared and brought to a fairly fine tilth before sowing. The previous treatment should be such as would destroy weed seeds. The presence of weeds in the early stages seriously interferes with the growth and cultivation of the young plants. Deep ploughing is recommended. This not only ensures greater feeding room for the roots, but it also has the effect of increasing the moisture-carrying capacity of the soil—a fact which must always be remembered, especially in those

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districts where the rainfall is limited and irregular.

— Sowing and Cultivation. —

Sowing should not take place until all danger of frost is over and the soil is thoroughly warmed, so that the seed will germinate at once. September, October, and November are usually the best months. If planted too early there is not sufficient heat in the soil to cause the seed to germinate, and it will either rot or the young plants will be so weak that the weeds will very quickly outgrow and smother them. It may be sown about the same time as maize, or two or three weeks later, with advantage. Drills 4 or 5 inches deep are struck out with a plough (a double mouldboard one is preferable) about 3 or [illegible] feet apart, and the seed planted along these by hand or machine. The latter is preferable, as it sows more uniformly; and by using a fertilising attachment, chemical fertilisers may be applied at the same time. An ordinary maize seed drill, which sows and covers the seed in the one operation, is one of the best for the purpose. During hot or dry weather the seed should be sown soon after the drills are opened, and before the soil has had time to dry. When this system is adopted, hilling can be dispensed with. It prevents a deal of evaporation from the soil by exposing a smaller surface. Besides this, the plants, having their roots deep in the soil, have plenty of support, and are not so quickly affected by dry weather. The amount of seed varies from 5 to 8lb. to the acre. When the plants are 6 inches high, they should be thinned out to 3 or 4 inches apart for rich soil, and more space allowed each plant in poor ground. With good, clean, and evenly-graded seed, the sowing may be adjusted so that very little thinning is necessary, thereby saving a tedious and rather expensive operation. The quality of the brush is affected to a very large extent by the manner in which this thinning is carried out. If too much space is allowed, the plants grow very strong and vigorous and produce brush which is coarse and unsuitable for market. On the other hand, if crowded too much they become very fine and weak. To obtain an even crop, it is essential to have uniform germination and size and later on to thin the plants to a uniform distance. Some growers prefer to sow the seed in "hills," 15 to 20 inches apart in the drills, leaving from six to ten stalks to each. The seed should be covered from ½ to 1 inch deep, the depth depending upon the character and condition of the soil. If it is dry, deeper covering is more necessary than would be the case if the soil were in a good moist condition. Where labour is scarce, several sowings should be made in succession to enable the grower to deal with his crop at regular intervals, and not have the whole area mature at the same time. Rolling the land as the seed is planted ensures a quicker germination and a better stand, particularly if the soil is a little dry. When drilled, the roller at the rear of the machine is quite sufficient. Should heavy rains fall after sowing, and before the seed has germinated, a light harrow should be used as soon as the condition of the soil will admit. When 6 inches high, the crop may be harrowed to keep the soil loose and to gradually fill in the drills, and thus destroy any young weeds. Broom millet makes rather slow growth for the first couple of weeks, and the cultivator should be kept going every fortnight or three weeks, to keep the surface soil loose and friable, to conserve moisture and prevent weed growth, and in every instance after rains. For large areas, a two-horse spring tine cultivator may be used. When the crop is half grown, under favourable conditions cultivation may cease; in any case the surface roots must not be disturbed by cultivating too deeply. In moist and exposed situations the crop may be lightly hilled, as an extra support is necessary. It is during the early stages of growth that the cultivator is of greatest value, as the soil may then be loosened fairly deeply. The most critical period is when the heads are forming. If dry weather should set in then, the brush will be short and stunted. It may be necessary in some districts to sow early or late in the season so that the crop will not come into flower during such trying conditions. Where irrigation is practised, it is essential to plant in suitably graded land and convey the water by means of open drills between the rows. After each application of water, and as soon as the nature of the soil will allow, the soil must be well cultivated to prevent caking and to conserve moisture.

The following makes a complete fertiliser, and may be applied at the rate of 2 to 2½ cwt. per acre:—

Superphosphate	80 lb.
Dried blood	64 lb.
Bone dust	5[illegible]
Sulphate of potash	30 lb.

(To be Continued).

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The general opinion of Clements Tonic is that it is unequalled for creating vital strength and appetite in all cases of lassitude, anæmia, poor appetite, melancholia, or weakness. All chemists and stores sell this great medicine in Australia. It will make your life long. Get it.

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Chicken Raising.

There are many ways of raising healthy chickens. This is what a writer in "Poultry" has to say on the subject. He makes it a rather more complicated process than most Australian poultrymen think necessary. His ideas about oatmeal are certainly different to the generally accepted belief.

"It is never advisable to give chickens much dry oatmeal or groats, because they contain too much amyloid matter. A little may be given when made into porridge with milk. Milk in limited quantities may be supplied as drink, but not as their only drink. If too freely allowed it has a tendency to cause constipation. Until chickens are about a week old it is advisable to give them a large proportion of their diet cooked [illegible] in such form it is easily digested. Of course, I am aware that in a state of Nature they would not have any cooked food, but the chief part of their diet would be different from that usually given to them, and they would have much better stamina, and consequently greater power of digestion.

After chickens are about a week old they may have some rape seed, hemp seed, small wheat, and screenings from grain, or fragments of peas or beans, known as cribbled corn, that is, corn broken small enough to pass through a coarse sieve. Beans, peas, and other pulse contain more than twice as much flesh-forming matter as the cereals, and much less amyloid matter; consequently more pulse than cereals may be fed to poultry with advantage, but in conjunction with a supply of juicy vegetable matter. Later on whole grain may be allowed, the time depending on their size, but the corn and meal should not form more than one-half the diet. It is a good plan to soak rape seed for young chickens, and, when old enough to swallow it, some large grain until it is on the point of bursting, after which it may be exposed to the action of the atmosphere for a short time before being supplied. Soaking the grain and causing it to swell allows of it being fed more liberally than when dry. It is necessary for chickens to have a fair fill of food when fed.

The value of green vegetable, and juicy vegetable roots, such as swedes, turnips, carrots, mangold wurzel, and the like, is very great, because they supply a large quantity of pure water, prevent overfeeding with solids, and contain very valuable saline matter, which cools the blood and prevents the chickens becoming feverish. When greenstuff is scarce rape seed may be strewn thickly on wet sand, placed in a rather warm place, and given to the chickens as soon as it has begun to grow; and it would prove very beneficial in keeping the chickens healthy, and stimulating their appetite. There is not any seed that will yield on as small a space of ground as great a quantity of greenstuff, or at so small an outlay. Those who have a little land to spare suitable for growing rape for all kinds of poultry should grow it; they may commence to thin it to feed to chickens as soon as it has grown the second pair of leaves, and if sown thickly it would fill out on a rod of ground faster than a score of chickens would need it, and last them for at least three months—that is, if the ground was of good quality and kept moist. Of course, I am only referring to the time when atmospheric conditions favor growth. Those who can obtain the young spring shoots of the dandelion should give some to their chickens, either cooked or uncooked, for they act very beneficially, especially, on the liver, are slightly laxative, and tonic, and allay a feverish condition when chickens are suffering from colds. Onion tops, too, are very good, and may be easily grown in the early months of the year by placing some old onion in mould in shallow boxes in a rather warm place, such as a cellar, or outhouse, or in a stable. They should be finely minced for chickens.

When one considers the dry nature of grain one should not fail to perceive how very necessary in a diet some juicy vegetable is to keep down the proportion of solids, and give bulk to it. In grain and meal there is only about 14 per cent. of water, but in juicy vegetables the average is between 75 and 80. A suitable diet would contain more than 50 per cent. of water, and to ensure as much, and the necessary proportion of flesh-forming matter, juicy vegetable and animal matter must enter into the diet in considerable proportions. Greenstuff should be minced for chickens, and vegetable roots should be cooked, pulped, or minced for them.

Short tender grass, such as is cut from frequently mown lawns, is very suitable for chickens after they are about a week old, and an advantage is to have some very young clover amongst it. If there are any plants on which the flower known as the buttercup grows amongst the grass it should not be given to the chickens, or the grass when it has been cut with a lawn mower, because even the juice of the plant, which is poisonous, may prove injurious to the chickens if they happen to devour it. However, they would not be very likely to do so, because the juice and the plant is unpalatable.

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Keeping Poultry.

Poultry keeping to the average city man is really rather dirty work for him and that is the reason he cannot make it pay him when he takes it up. Those going in for fowls should think it out well and be prepared to do all the necessary work, or success cannot possibly follow their efforts. They must be prepared to clean out the houses regularly, dig over the ground and keep it fresh, and cleanse out the water dishes every morning. Then they must be able to handle fowls in sickness, administer medicine, and cleanse them, and a host of other little things must be done—or—well—failure.

Poultry keeping is really a business that requires constant attention from daylight to dark, therefore it is hardly necessary to point out the rabid eight hours day man cannot find a place in the ranks, work, work, work, there is always something to do every turn you take, you can see something else requiring attention; that is the great reason, why; where the work is relegated to servants that bad results follow. The owner of poultry if he has hired labour should supervise things very closely for it is the little neglects, the little forgets, and so on, from which spring trouble.

Remember the warm weather is coming when your fowls want more attention than ever, never let your work be done with a grudge. Give them ample shade: by the way—how many go to great expense clearing ground for poultry a big mistake, if you leave enough timber standing to protect about two thirds of the run from the rays of the sun you will thereby give the fowls a better chance to go good.

After shade the next thing is a steady supply of fresh water for drinking. If you have not got the length of having water laid on, then you must graft to supply it, for in hot weather it should be renewed three times a day. Just study how they relish it when given fresh.

With the warm weather comes multitudes of vermin also. If this has not struck you, then be up and doing. Your hens have possibly gone off laying, yes, and no wonder, examine the perches and you will find they are alive. Never thought of it. Go over all the perches with kerosene or tar. These are the red mite which suck the blood from the fowls during the night. You must get rid of them. Tick proof perches prevent them becoming a nuisance.

Yes; Tick, this is the season again when the young broods of tick begin to get about. Keep an eye on the birds. If any look funny, examine them for the tick, and if they are there rub waggon grease well in and that will kill them. When you find you have tick on the premises get to work with hot tar, run it in all the crevices and cracks and it will in most cases eradicate them forthwith.

Don't lose interest in the chicks, keep up the usual attention and care if you want to win with them, keep them growing with regular meals. Growing birds want more meat and green stuff than do older birds.

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Feeding for Market.

There is one point in which the average farmer has still much to learn, that is, in the marketing of his birds in proper condition. If stock are well fed and properly housed from the time they are hatched they are usually in good condition at market day, but not many people are good feeders; they most err a little on the light side, their birds then require to be penned for some 12 to 14 days and fed heavily to top them off. This is a little extra work, but it must be done if best prices are to be realised. A little practice is necessary to learn when each bird has reached market condition, for once that stage is reached further feeding is wasted.

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Comb Picking.

Where birds become over-heated, they are in a constant state of irritation, and pluck each other's feathers out, while the hens frequently pick the cocks' combs all to pieces. This can be avoided by giving them some cooling medicine, and providing the birds with plenty of occupation. Idle birds very quickly get into mischief, and when they have acquired bad habits it is very difficult to break them out of the birds. When hens are noticed to pick the cockerels' combs, they should receive treatment at once, else they become very fond of the blood they draw in this way, and the male bird seems to like the attention given them by the hens, and stand perfectly still to have their combs disfigured.

As soon as a hen is noticed to be picking the male bird's comb, she should at once have her beak cut, and if the flesh of the comb has only been slightly bruised, its condition can quickly be restored by being bathed in water in which a few drops of Condy's fluid have been placed, and after being wiped perfectly dry, a liberal application of carbolised vaseline.

When the comb has been disfigured, the male bird should be removed from the hens at once, and then have its comb treated in the same way, with the addition of some Fuller's earth sprinkled over the surface, as soon as it commences to heal, discontinuing the vaseline.

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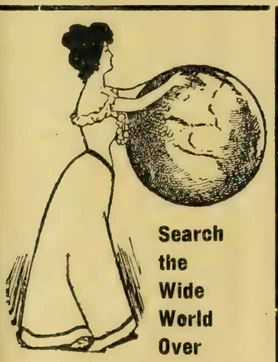
There is, or would be, little necessity to introduce new blood to keep up the stamina or vigor of a flock if the best specimens of each season's raising are reserved for breeders. It is the disposing of the best, those that develop quicker than the rest of the broods, that runs down the flock.



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The Government and the Poultry Industry.

Several years have now elapsed since the Government of the day commenced to, what they called, assist the poultry industry. It is therefore reasonable to ask what if any success has attended their efforts which have involved the expenditure of a comparatively considerable sum of money. Actual figures would be difficult to obtain but we shall probably be somewhere near the mark in putting it at £20,000. It is not necessary to refer to the various projects which have been discussed and either carried into effect or dropped. Minor mistakes have, no doubt, been made as was to be expected, but the most serious error was the initiation of a cart before the horse policy, of which we complained at the time, in the encouragement of increased supplies before finding an assured outlet. It required a very severe knock in a commercial sense to convince them that the profitable disposal of immense quantities of eggs was an unexpectedly stiff proposition. Promising, no doubt, on paper, but rather disastrous in practice. But to return to our original question—What has been the actual result of Government assistance? In expressing the opinion that it has been somewhat of a failure we shall probably differ from a number of very worthy people, but on the main facts as we know them, it would be difficult to come to any other conclusion. We have read official estimates that the value of the poultry industry to the State was increasing at the rate of scores of thousands of pounds yearly. It is easy to make such statements but to prove them would be found a much more difficult matter. Export figures are probably the most sure criterion of progress, and though these have somewhat increased it is questionable whether they have done so in proportion to the increase of population and the area under wheat. The small increase in the average price of eggs would seem to show that relatively fewer eggs are produced now than was the case five or six years ago, for even allowing for greater general prosperity it is difficult to suppose that consumption per head has increased to any marked extent.

— Roseworthy Competition. —

Whatever may be the opinion of the success or otherwise of Government assistance of the poultry industry there can be no question as to the standing of the Roseworthy competitions, in later years at all events, for as an instance of the possibilities of doing little with a great opportunity they have been unique—colossal. As someone expressed it the other day they are about as instructive as a dog fight and much less interesting. Viewed from a reasonably broad standpoint, what are the results of the last five years' work? Summed up, they are that a varying number of fowls of varying breeds will lay a varying number of eggs at a varying cost, which it will be admitted is altogether too various to be adequate return for their cost. Not money cost, for they probably pay the college a small profit, which could, however, no doubt be made with much less trouble out of pumpkins or potatoes. The financial aspect as it affects the Government is not of any importance, probably some sort of figures are available somewhere, but as it took a Royal Commission three months to find out that an estimated loss of £5,000 was an actual loss of £10,000, they are probably compiled more for ornament than use.

Even ardent supporters or apologists for the Roseworthy failure find it difficult to make any excuse for the lack of originality, and practical purpose shown or to make a plain statement of actual progressive results. They certainly say and it is true in a general way, that they have drawn attention to the possibilities of profit in poultry. They have certainly shown that a great many batches of six hens, have at a—from a farmer's point of view—prohibitive labour and capital cost, paid more or less profit on food consumed. It is also said that they have brought to light a number of successful breeders and that the sale of birds by them to farmers is beneficial to the average production of farm flocks. This again is true to some extent, but the general impression of the extent of this influence may, we believe, be boiled down a good lot without detriment to our knowledge of actual facts. In the first place 75 per cent. of the competitors are backyarders and small breeders, here to-day and gone to-morrow, who buy from the leaders and are out for a soft thing, for if they fluke a win or a leading position, the gains may be fairly substantial. Their influence for good or ill is negligible. In any case they are not often very successful so don't count. Of the country breeders who are successful and whose yards are a centre of poultry interest, it may be said that they are doing very good work in their own particular districts. There remain a few fairly consistent breeders and what stock of theirs gets to farmers should, on paper

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he farm flock—improvement abili-
y of highly bred strains if repre-
entatives were a little more con
tant in their public performances.
f expert breeders, occasionally,
ose their grip on the record mak-
ng streak in their flock, it does
ot argue well for the ability of
he homely way-back farmers be-
ng able to catch hold of it.
linor benefits derived from com-
etitions are, so we have read, the
radual improvement in average
aying capacity of birds penned.
n this point one might say that
hen two or three experts, two or
hree hundred competitors and two
r three thousand hens get toge-
her and stop together for five
ears a total average improvement
f a dozen and a half eggs
s about the least that could be
xpected of them. It is also
laimed that the mothers, sisters,
nd cousins, and the aunts of com-
etitors, and the general public
nd pleasure and interest in the
eekly reports. If they do, and
robably some are capable of do-
ng so, it must be confessed that
hey have an enviable capacity for
inding it on cheap and harmless
ines. Quotation (frequently incor-
ect or inadequate, we have no-
ticed) in oversea papers is also
onsidered an excellent advertise-
ment for the State. We can pass
that for what it is worth. Lastly
it is said that the excellent results
at Roseworthy have led to the es-
tablishment of a number of up-to-
date poultry farms. We rather
question whether in the long run
this will be regarded as an un-
mixed blessing by those principal-
ly concerned, for the bulk supply of
South Australian eggs comes from
the farmer and always will do.
This supply is uncontrolled and un-
controllable, and when the time of
low prices comes again, as it sure-
ly will, and the farmer finds it ne-
cessary to turn more of his
bushels of wheat into eggs, and so
inevitably force down prices, the
poultry farmer, pure and simple
will not be in a position that the
ordinary individual will envy. His
food bill will be less but his pro
duct will, alas, be very much
cheaper Rather a doleful view to
take of poultry possibilities per
haps, but not unreasonable. Lay
ing competitions are, no doubt, of
use. No one disputes such an
obvious fact. What we complain
of is that with such a great oppor

tunity, they, with the exception of Hawkesbury, attempt no work which is of practical use to poultry breeders. There are many questions of more interest to the average breeder than whether A's birds can lay more eggs in a given time than B's can. For instance. To what extent, if at all, is housing necessary? At what stage if at all does increase of numbers in a pen affect individual production? Is meat necessary, merely desireable or unnecessary? What are the results of feeding grain only as against mash? To what extent can green food be substituted for other foods? What influence, if any, on production, does the male bird have? All these questions and many others could have been definitely and completely answered during the past five years and would form a considerable and valuable addition to the sum total of poultry knowledge, and this might, by a little arrangement, have been accomplished without detriment to the competitive side of the tests. We suggested work on these lines five years ago. Is it not time someone else woke up?

(To be Continued.)

WANTED TO SELL.

DORKINGS.—Silver and Coloured and Indian Game low set up-to-date strain. Columbian Wyandottes. Eggs 10/- for 15. Birds from 10/6 each, according to quality. — J. J. GABB, Somerton Prize Poultry Yards, Glenelg, S.A. 8-11.

INCUBATORS AND BROODERS, Simplex, awarded first price (silver medal) Adelaide Exhibition, 1910. Agent for Cort's Patent Cooler-safe, a boon in summer. Send for price list.—D. LANYON, Manufacturer, 46 North Terrace, Kent Town. 6-12.

Occasionally a few chickens will be found which seem to have little air bladders between the flesh and the outer skin, puffing out the sides to a remarkable degree. No serious results are likely to ensue from this complaint, which is simply got rid of by puncturing the inflation by running a needle right through from one side to the other. The air will probably accumulate again, in which case repeat the puncture. If the fowl is out of sorts, add a little iron tonic to drinking water and feed very lightly.

J. O. CHILD,

174, RUNDLE STREET, ADELAIDE, (Opposite FOY & GIBSON).
TAILOR & MERCER.

Begs to notify the Country people and all others that he has opened business as above. Indigo Serges, Fox's Serges, and all kinds of imported tweeds. Everything in the latest make and design. Ready made clothing of all descriptions. Shirts, Ties, etc. Patterns and Self-measurement forms on application. A Trial Solicited.

"ONTARIO" WHITE LEGHORNS.

have twice won Roseworthy Egg-laying Competition.
World's Record for placing the first five pens in Blenheim Competition 1906-7, 100 pens competing.

I am offering eggs from Roseworthy winners at a very low figure to the first 20 applicants. This pen beat all Australasian Competitions held in open yards for 1908-9.

High class stock and eggs in season satisfaction guaranteed.
Telegrams—" Ontario."

T. B. BROOKS - - Clarendon.

TICK

South Australian poultry owners have found that the very best remedy for the TICK CURSE is

Faulding's Phenytas.

Periodically dip the infested birds and spray infested houses and runs with Faulding's Phenytas and there will be no further fear of tick.

FAULDING'S PHENYTAS is Absolute DEATH TO THE TICK

Poultry Foods and Their Feeding Value.

Of late years a great many experiments have been carried out, chiefly in the United States, on the best kinds and methods of feeding, and in consequence poultry-keepers know far better than formerly what foods are best adopted for feeding poultry. Experts, having agreed more or less on the composition of an ideal food, and having found that no one meal or grain supplies it, have striven by combining one or more foods to gain approximately the ideal food; this is called balancing rations. There is no doubt our knowledge of food values is a great help, enabling us to feed fowls more wisely—in fact, more scientifically; but it must be remembered that all the experiments, details of which have been published, have been tried on fowls in confinement. The simpler methods of the farmer are in many cases quite as affective for the production of eggs as the elaborate scale of rations given at experimental stations. In fact, where the farmer more usually fails is in the quality of his stock, not in the food given them being unsuitable for egg production. Fowls at liberty feed themselves as much as they can; they eat grubs, worms, seeds, and any waste product in any degree eatable they come across. They are scavengers, and refuse nothing, but as they cannot find enough food to keep them in health on an ordinary farm, except after harvest—when, if turned on the stubble, they will for a time support themselves—what they pick up must be supplemented, and the simplest form of food to give them is grain—wheat, oats, maize, or barley. For fully eight months of the year farmers' fowls should do very well on grain, but in winter a breakfast of soft food stimulates egg production better than anything else. But while the farmer need not take the same interest in the ideal rations for a fowl as the poultry-keeper with limited space, whose fowls lead a more artificial life, everyone who keeps fowls should know something of the composition of poultry foods, and therefore why it is injudicious to give some foods under certain circumstances, and also what kind of food suits fowls best.

— Chemical Value of Foods. —

Chemists divide foods into seven constituent parts—namely, albuminoids or flesh-formers; fats or oils, the value of which is expressed in carbo-hydrates; carbo-hydrates consist of carbons in less proportion than in fat, this supplies heat and energy, but is not directly represented, as the fat group is, in the animal body itself; salts and minerals, husk or fibre, and water. Even a dry food like ground oats, according to the chemists, contains 10 per cent. of water. This is because it contains a variable amount of hydrogen and oxygen in the proportions which form water; it is therefore classified as water, presumably for want of a better definition.

The most valuable part of the food is the proteids, containing nitrogen. These are called albuminoids. Food, however, must also contain a certain amount of fat, as this is necessary to sustain a healthy body. What is needful in seeking an ideal food is to get a due proportion between the albuminoids and carbo-hydrates. A food containing one part albuminoids to six parts carbo-hydrates is what we should endeavor to give. If a food contains a larger proportion of albuminoids, foods scarce in this constituent can be added to it. Far and away the richest in albuminoids are beans and peas; they contain more of it than horseflesh or fresh-cut bone, but their great deficiency in fats and carbo-hydrates makes it unwise to feed this grain largely; it requires to be balanced. Another grain of great value to the poultry-keeper, yet very little grown, is sunflower seed. This is rich in fat, contains a good proportion of albuminoids, and is not so starchy as some foods. Yet sunflowers are little grown, and in place of it hemp seed is sometimes employed, though this is not nearly such a valuable food. Almost an ideal food is oatmeal, but this is too expensive for general use. This works out as follows:—Albuminoids 18 per cent., fats and carbo-hydrates 77 per cent., salts 2 per cent., husk or fibre 1.5, and water 9 per cent. Oats would not be inferior if it were not for the large amount of husk they contain—19 per cent. This, of course, depreciates from their feeding value, and shows why, in buying oats for poultry-feeding, the boldest should be purchased, the estimate of 19 per cent. being made on oats of good quality. Poor oats would contain far more husk, and would need to be bought very cheaply to make them profitable feeding. The husk or fibre has no feeding value.

— When Maize is Harmful. —

That maize is harmful to poultry unless they have plenty of exercise is well known, but analysis does not show it to be much inferior to wheat; it has a tendency, however, to deposit yellow fat in the intestines, though even analysis cannot tell us why. It has, however, been found that cooking maize banishes this tendency, and makes it a valuable poultry food. The constituent parts of wheat and maize works out as follows:—Wheat: Albuminoids 12 per cent., fats and carbo-hydrates 71.9, salts 1.8, husk or fibre 2.3, and water 12 per cent. Maize: Albuminoids, 10.5, fats and carbo-hydrates 74.5, salts 1.5, husk 2.5, water 11 per

KOONOOWARRA POULTRY YARDS.

Barred Plymouth Rocks: Special Exhibition pen. Ckl, 1st and Sp. at Victoria P. & K. C. Show; 1st and Medal Essendon Show, Vic.; 1st and Sp. Adelaide P. & K. Club Show, 1911; Hens and Pullets, all winners, P. & K. C. Show, Adelaide, 1911. A limited number of settings only. £2 2s. per setting.; Good Utility, £1 1s.

Buff Orpingtons: Birds have won prizes whenever exhibited. Good sound color and healthy stock; also good winter layers and splendid birds for Export trade. 10s. 6d. and £1 1s. setting.

White Leghorns: My Roseworthy pen averaged 220 eggs per hen, and are now mated to cockerel of well-known laying strain. 7s. 6d. per setting.

White Plymouth Rocks: Snow-white birds, easy to breed and rear typical Farmer's fowl, good Winter Layers and excellent Table Birds. A few settings only to spare at £1 1s.

White Orpingtons: Imported and prize-winning stock. Won 1st Ckl, 1st Pullet Royal Show, Adelaide, September, 1910. Great Winter Layers and good Table Birds. 10s. 6d. and £1 1s. setting.

Pekin Ducks: Never beaten in show pen. Four Firsts, 1 Second, 2 Sp. at P. & K. Club Show, Adelaide, 1911, out of five entries. Two Firsts, 1 Second and Special at Royal A. & H. Show, Adeleide, Sept. 1910, out of three entries. A limited number of Settings at £2 2s. Good Table Birds, specially mated, suitable for Export trade, 5s. per setting. Reduction for quantities.

Eggs securely packed and delivered on Rail or Coach (buyer pays carriage). All Eggs Stamped Koonoowarra. Infertiles replaced once.
Terms: Cash with Order. I keep nothing but A1 Stock. I cull heavily and breed only from the Best.

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ent. The chief fault of what is s proportion of carbo-hydrates, aking it rather a heating food fed exclusively. Potatoes, which re used to some extent for feed ıg poultry when they are cheap, re nearly all starch or carbo-hy- rates and water, the two com- rising 91.5 per cent. of the whole. uch vegetables as cabbage and ırnips contain over 90 per cent. f water, and practically no carbo- ydrates; but perhaps the great- st curiosity analysis shows us is e value of skim milk. Practical ience teaches us of the enormous alue of skim milk either for fat- ening chickens or raising them hen quite small. If small chickens ave milk instead of water they row much faster. Yet skim milk ntains 90 per cent. of water, 3 per ent. of albuminoids, and 5 per ent. of carbo-hydrates. Obviously ere is some virtue in skim milk hich analysis cannot disclose, ough certainly the proportion of buminoids compared with the ırbo-hydrates is high.

We may divide poultry-feeding to three classes. Chickens need viously a different diet than adult s, and fowls that are being fat- ned need different food compared ith laying hens. Chickens have make tissue, and therefore ould have as much albuminoids possible. Thus we see why eat is so good for growing icks. Fowls when laying also ed plenty of albuminoids, but we e hampered, first, by the cost, d, secondly, because if we give o much we over-stimulate the wls, and do them harm. Fat- ning fowls do best on ground ts, milk, and fat; we are thus le to give them a large amount albumen. This feeding is unna- ral and expensive, but then it ly lasts a short time.—"C.D.L." New Zealand Farmer.

◆

he Moist v. Dry Mash Hen.

The question of the relative lue of moist mash as against y feeding for laying hens is one considerable interest and im- rtance. If it could be shown at dry feeding gave equal results the moist mash, then no doubt ultrymen would unanimously opt the former, and thus save nsiderable time and labour. ere has been a considerable antity of correspondence on the bject in the poultry section of e press of the Commonwealth ring the last few months, but have not noticed that any very inite information has been forthcoming. The moist mashers appear to swear by their method and the dry feeders to be equally convinced of the superiority of their way of doing things. Recently we came across a record of some experiments in this connection which were carried out at one of the American State Experiment Stations. The report before us states that "the leading feature of the poultry experiments during the past year has been the continuation of the experiments comparing the dry with the moist-mash system of feeding. We have carried through six experiments, three during the winter and three during the summer, using in these experiments six different flocks of fowls. The results have been similar to those obtained last year. In the majority of the experiments the fowls receiving the moist mash have produced a greater number of eggs. The moist-mash feed has seemed to be superior to the dry feed in four out of the six experiments, and the number of eggs in most of these experiments has been materially greater than the number produced under the dry system of feeding. In the two experiments in which the dry system gave the greater number of eggs, the differences were relatively small. Averaging the six experiments, the results are as follows:—Number of eggs daily for 100 hens—Moist mash, 36.3; dry feeds, 34.4."

Apparently a slight advantage to the moist mashers, but actually when the question of labour, expense of cooking, etc., is taken into account the balance of profit would be on the other side.

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Chickens With Vermin.

So many losses are caused through chickens being affected by vermin, and this, of course, particularly applies to chickens kept in a confined space, that a little advice on the subject is necessary. A few days before the hen is due to bring off her chickens she should be taken and most carefully examined for vermin. Lice especially are the pests. They lie so close to the feathers that it requires experience to find them. Even if only a few are seen, it is very necessary to thoroughly dust the hen all over with insect power until she is quite yellow with it. Hold her so that she does not flap it all off, as she will attempt to do. Do this again after the chicks are hatched and are well on their legs. Just before moving the hen and brood to a clean coop. Then let the hen go, and she will shake herself with the powder over the chickens, and will fill the coop with dust, which is exactly what is wanted. If she be examined next day the dead lice will fall away from her, and you may be sure that you have saved a brood of chickens. The coops should be moved daily, and on no account should the chickens be allowed to sleep on any ground that the mother has fouled.

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Gaping.

Spasmodic gasping, or gasping, is caused by two different complaints, viz., by what is known as Gapes, due to the presence of a parasite in the trachea, or windpipe, or it may be due to an affection of the bronchial tubes or lungs, each requiring entirely different treatment. The first-named complaint is, fortunately, very rare in Australia, and to make certain of its presence, an examination of a dead fowl will speedily settle the question, as the worms are easily noticeable attached to the interior of the windpipe; or if a live fowl is experimented on, a feather stripped, all except a tuft at the end, should be inserted into the trachea and twisted to dislodge the pests, or a double horsehair can be used; and to kill the gape worms in the trachea, first dip the feather in salt and water, or let the bird inhale carbolic fumes or lime dust.

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Eggs! Eggs!

Sittings from Heavy Laying

White Leghorns
Black Leghorns
Black Orpingtons
Silver Wyandottes

15 Eggs to each setting. Guaranteed fertile or replaced. 10/6 per setting.

T. E. YELLAND,
S.A. Farmers' Co-Op. Union, Ltd

Pigeons and Canaries.

Magpie Breeding.

(By "Blue Rock.")

I have been breeding Magpies a sufficient numbers of years to have realised that, like anything else worth doing, the difficulties are many, and definite progress is likely to be slow. Probably I have made every possible mistake, and shall probably continue to make a fair percentage of errors; but I offer my readers certain definite methods which experience has taught me to be not wholly erroneous, and which are yielding results more or less satisfactory.

I have long been a student of Darwin, and my endeavour is to apply his theories, intelligently and patiently. Patience is 50 per cent. of the breeder's skill. Given a loft of birds, the fancier must select rigidly and skilfully year after year. He must not run after new blood. He must not neglect to use the result of his labour. He must not allow himself to be tempted into selling a good bird which may represent the result of years of breeding. Last season I refused £5 for a bird whose youngsters this year are better than their father.

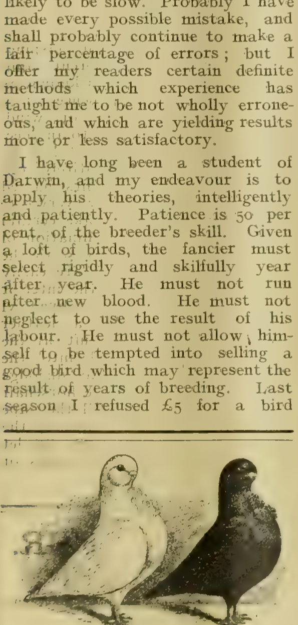
But now, to my subject. I will first outline what I consider the points of a good Magpie, approximately in their order of importance to the breeder. The first quality wanted is slimness—called by experts, "snipiness," all over. This may be subdivided into length of neck, length of limb, and narrowness of body. Next in desirability is a "snaky" head, and this also consists of several distinct features; they are, length of beak, length of face, and fullness of muzzle, without suspicion of stop but also without roundness as with the Show Homer. One should see no daylight when a ruler is put on from the forehead to the tip of the beak. There should be no propensity to downfacedness, but the beak should be carried perfectly horizontal. The last points are colour and marking, not forgetting shortness of feather; another desirable quality being that the neck should taper to the throat, where thinness sets off the head and tends to abolish appearance of coarseness. The young fancier who can produce a bird showing these points in excelsis, carrying the head well up, and the wing butts away from the shoulders, will beat at least the majority of the winners in my loft.

The first concern for a loft is to found a strain. Now how shall this best be done? Despite what others may say, I maintain that the most scientific way to proceed is to buy three or four pairs of absolutely unrelated birds. Furthermore, I believe that the surest and best way is to procure the best birds the pocket of the fancier can afford. I admit that the poor fancier is at disadvantage in such a procedure; but I feel that the advice is sound. Each fancier must do the best he can. In choosing birds it must be borne in mind that, as a general thing, colour and marking follow the cock rather than the hen; and that the hen is to be depended on for type and head—particularly the latter rather than the cock. As I have already said, I believe that in the long run it is sounder policy to choose all unrelated birds to begin with, as this postpones the evil day when the results of in-breeding will have to be reckoned with.

Further, I would advise the beginner to purchase his three pairs of unrelated birds on something of the following plan:—The cocks to be the best for type and head available from lofts noted for the percentage of well-marked birds they produce. On the other hand, the hens should be the best marked specimens to be procured from lofts producing a good percentage of good-headed birds.

In either case attention must be paid to type, but this point should be particularly dwelt on in the case of the hen, a weak hen will surely give weak progeny, whereas a thicker set neck on a cock is liable to be refined by a slender necked hen.

Our next task is to pair our birds to best advantage. In doing this the breeder must aim at preserving a balance of points; that is, two birds must not be paired which are decidedly weak in the same set of points. For instance, two weakly-marked birds will almost certainly give a bad result in this respect, whereas if the weakness be on the hen's side only the danger is far less. Again the points do not rank in the same order as regards difficulty of breeding; example—Marking gives comparatively little trouble, but good heads are few and far between, while long necks stand about midway as regards difficulty of breeding. I would say, however, that



O.K. LOFTS.

This is where the Champions are bred. At 1911 Sydney Royal we won 2 Champions, 6 Firsts, 3 Seconds, 2 Thirds, with 11 entries only. At S.A. Pigeon and Canary Show we won the "Blondinette" Cup, the "African Owl" Cup, against 15 others also the "Short face Tumbler" Cup for best young tumbler, all with home bred birds, also a number of Specials, Firsts, Seconds, and Thirds. To give amateurs a start I have for sale Blondinettes, African Owls, Short face Tumblers, Nuns, Turbits, etc., from 5/- each. Fifty to clear before breeding season. Apply at once to

E. A. GROSSER,

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PIGEON SPECIALISTS,

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Meat Meal ... ... 25 per cent.
Bone Meal ... ... 25 ,,
Blood Meal ... ... 25 ,,
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Nitrogen 7.67, Ammonia 6.88, Phosphoric Acid 17.28, Total Phosphate 37.67.

Packed in bags, all sizes, from 1/6 to 15/- cwt.

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s length of neck is a distinguishng feature of the Magpie, it would e advisable to emphasise this oint from the first by putting the ongest-necked birds together where ossible, even if by so doing risks re taken in other points. The irst year's breeding will produce a ir quantity of culls which should e sternly weeded out, either by illing, selling, or giving away.

Certain definite principles should overn the mating for the second ear. For instance it seems to be certainty that pigeons in geneal tend to resemble their grandarents. Now the breeder who nows this and takes it into acount is likely to reap a reward, or in matching his birds he can liminate some of the apparent unertainty of breeding. Suppose he as to choose between two cocks f which the one is better marked han the other; if the parents of he less well coloured were better n this than those of the other, hen it stands to reason that the ird of the better parentage is nore likely to give better results han the other, even though its narking be slightly inferior to hat of its poorer bred—from the olour point of view—rival. On the ther hand, if the bird in question e a hen, we can bear in mind hat she is more likely to reprouce the head and type of her arents rather than their markg, and that knowledge is of disinct value, as we can expect her o throw strong headed and well yped birds, even if she be stronger n marking than in type and head, rovided only her parents were trong in these points. For the hoice of the next year's pairs the ame process of merciless weeding hould be gone through. Don't keep bird you feel to be distinctly inerior—a thing the beginner is apt o be tempted to do in hopes that e may fluke something good, as he ertainly may, but is hardly likely o be lucky enough to do. In most hings of life the race is to those who systemize all their actions. n mating do not be led away by ertain methods of inbreeding, such s pairing the son to the mother r vice versa. My advice is to air the most suitable birds, but void closeness of blood unless it eems that you cannot avoid it. nbreeding is not of itself harmful, nless the birds to be mated are kely to produce (by the theories utlined above) unhealthy progeny. n a few years by pursuing the olicy I am enunciating, all your irds will be related, but long beore this you would have come to dead end by mating parent to hild and brother to sister.

A few words about colour will ot be out of place; I am now of the opinion that much time is wasted in pairing blacks with reds. In these days plenty of good birds in all colours are to be got, so it is best to keep these colours separate. Reds and yellows may be crossed by using the cock of the required colour. In these colours eschew all birds which show an ashen rump, as this is an abomination, and is extremely difficult to breed out. Blues and Silvers may be crossed in the same way as Reds and Yellows, and using the same precautions, but pale Silvers should not be used except to intensify the silver. Of course Creams naturally go with Yellows, and, seeing that Silvers and Yellows are so alike in appearance when hatched, I feel that they may be crossed, but not too freely. Wherever two colours are crossed it is wise not to use the progeny which show weakness of colour.

Do not expect to breed a champion in the first or second year. Of course you may do so, but you are breeding for results which should show themselves in a gradual improvement of the whole loft, rather than in the production of isolated champions. In conclusion I say—Be wise. Be patient: Hasten slowly but surely, and you will succeed.

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Pigeon Notes.

By Rambler.

I am very sorry to hear that the resignation of Mr. Hocart, as secretary of the South Australian Canary and Pigeon Society is an accomplished fact, but in Mr. C. Creer and Mr. D. Hayward, who have now undertaken the duties, we have two good men, who will, I am sure, do good work for the Society.

As mentioned in last notes Mr. W. B. Viney has made a start in Blondinettes.

The birds from the O.K. Lofts included the beautiful Red-laced hen (Daisy) a first prize winner at the P. & K., C. and P., and Royal Shows, Adelaide, and with her a nice Brunette cock, bred from a Red arrow cock, which was placed first at the last Sydney show.

A friend writes me "that things must surely be looking up with the pigeon fancy in S.A." He judges by the amount of business he is doing and that is certainly a good guide.

The S.A. Canary and Pigeon Society are getting a move on. Monthly meetings and young bird shows to be held. Yes, things do look nice and bright just now.

Mr. Geo. Ball, of North Adelaide, did a big win at the Port Adelaide Show in taking the special for best bird in the show with his English owl. Wish him luck and may he breed many like it.

Mr. W. J. Hughes, of Broken Hill, has, I am informed, just received a lovely pair of Blondinettes. The cock, a blue laced, has won scores of prizes, including several champions at Sydney Royal, and also special for best pigeon in the show at Lithgow, N.S.W., in a large entry. The hen is only a youngester, also a blue-laced, which will, I am told, make up a lot yet.

More Short-laced Tumblers for a South Australian fancier arrived per the s.s. "Commonwealth" on August 4, including a clinking almond cock, a kite cock, and a very nice kite hen. The almond cock is a real champion as he carries a rich almond ground colour all over his body, is very strong in knob and has a well set beak.

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PRACTICAL SHIRTMAKER.

Good fitting garments at prices below imported shirts. A good selection of best material always in stock.

Send for range of patterns.

Home Notes.

Hygienic Toilet Hints.

Varnish on the hands may be removed with methylated spirit. Wash afterwards with soap and water.

A simple breath sweetener is made by taking one pint of distilled water and adding to it one tablespoonful of pure borax, one ounce of liquid myrrh, and five drops of thymol. One tablespoonful can be added to a glass of water. Use three times a day.

Red hands and red noses are often caused by an unwise diet, and by the use of impure soaps. Tight clothing is another cause. Wear your belts and collars very loose. Eat lean meats, fruits and vegetables, and avoid all pastries, salads, greasy foods and strong coffee.

When the feet are weary and tender through long standing or walking during the day, there is nothing which will give more relief than a warm foot bath, in which has been dissolved a handful or two of sea salt. Bathe the feet and limbs with this for about ten minutes, and then rub them well with a good rough towel. The effect is delightfully refreshing, and if you do this just before going to bed insomnia, for that night at any rate, is not likely to trouble you.

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Hints for the Care of the Hair.

1. Brush the hair evenly with a soft brush for ten or fifteen minutes each night before going to bed, and then plait it up loosely.

2. Once a month, when so plaited, run the closed hand up this plait, and with a sharp pair of scissors snip all the shorter hairs, the ends of which will stick out from the plait.

3. Never use tongs; avoid the use of a comb as much as possible.

4. Once or twice a month—or even oftener if there is a tendency to scurf—rub the yolk of a new-laid egg well into the scalp. Washing it off with warm water and borax (a teaspoonful of the latter powdered and dissolved in each pint of the former), dry thoroughly, and then anoint the scalp very lightly with pure vaseline.

5. Expose the head to the sun and air as much as possible.

◆

The Value of Charcoal.

Nearly everybody knows that charcoal is the safest and most efficient disinfectant and purifier in nature, but few realize its value when taken into the human system for the same cleansing purpose.

Charcoal is a remedy that the more you take of it the better; it is not a drug at all, but simply absorbs the gases and impurities always present in the stomach and intestines and carries them out of the system.

Charcoal sweetens the breath after smoking, drinking or after eating onions and other odorous vegetables.

Charcoal effectually clears and improves the complexion, it whitens the teeth and further acts as a natural and eminently safe cathartic.

It absorbs the injurious gases which collect in the stomach and bowels; it disinfects the mouth and throat from the poison of catarrh.

Facial Neuralgia.

If the neuralgia is located on the right side of the face the left hand and wrist should be placed for ten or fifteen minutes in a basin of water as hot as can comfortably be borne. If the left side is the one afflicted the right hand and wrist should be placed in the hot bath. The treatment can be repeated if the first does not relieve the pain. The explanation given by physicians for this peculiar treatment is that the two nerves which have the greater number of tactile nerve endings are the fifth and medium nerves. As the fibres of these two cross, any impulse carried to the left hand affects the right side of the face, or, if applied to the right, the effect will be the reverse. This is caused by the crossing of the cords.

◆

To Wash Lace.

Cover a bottle with fine white flannel, and tack the edges of the lace upon it, being careful to fasten down every little point, and lay the lace as straight as possible. Squeeze the bottle in lukewarm soap and water till the lace is clean, and rinse in the same way. Put in the sun to dry, dip bottle and all in starch, then wrap clean cambric round it, and let dry in the open air. When quite dry the lace may be untacked, and will look as good as new, lace may be washed in the same way, but without soap. A few drops of ammonia may be used instead. Black lace should never be ironed.

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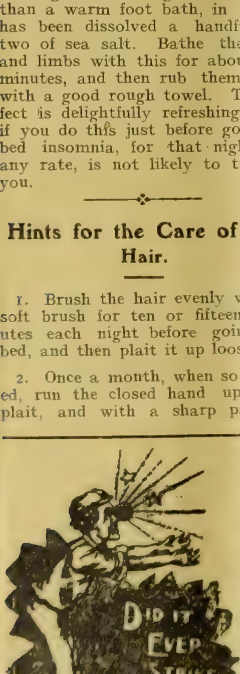
How to Make Salads.

During the spring months particular care should be taken that, at the majority of the family meals a salad is placed on the table. There is a great variety to be found in the vegetable basis and in the dressing; and hardly in any month of the year can a lack of material for salad be complained of. Then, again, cooked as well as raw ingredients may be used with economy and advantage. The dressing is a most important point, and one on which hardly two people agree. Those who have the greatest claim to our respect in culinary matters seem, however, to adhere to the simplest methods, and to advocate an extremely temperate use of the vinegar cruet.

A common error is to allow the fresh greenstuff that is to be used



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to soak in water, with the idea that it keeps fresh. It is far better to merely place it in the coolest possible place on a stone floor or slab.

Now, here is another thing that must be good if your salad is to be appreciated—I mean the oil. Many think that as long as it bears the words "salad oil" anything will do, with the natural result that they often purchase inferior kinds, more or less rancid.

It is best, I find, to buy it in small bottles, as it requires to be quickly used when once opened. Always keep in a cool place.

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Points of Interest to Mothers.

— What Baby Should Weigh. —

There are few mothers, perhaps, who do not like to weigh baby. The increase in his weight is such a safe guide as to whether he is getting on. It is a good plan to put him on the scale once a fortnight, and to keep a record. Children, of course, differ, and a small child may increase at a slower rate than a big one; still the increase should be there, or you may be sure there is something wrong.

Here is a table for an average baby :—

At birth he should weigh 7lbs. 8ozs.

At fourteen days he should weigh 7ozs. more.

At three months he should weigh 12lbs. 8ozs.

At six months another 3lbs.

At nine months 18lbs. 7ozs. is about regulation.

The year-old baby should turn the scale at 6ozs. short of 22lbs.

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Tried Recipes.

— Orange Marmalade. —

Slice very thin, rind and all, three large seedless oranges and one lemon. Pour over the sliced fruit eleven tumblers of cold water, and set away for twenty-four hours. Then boil slowly for one hour. After boiling, add four pounds of granulated sugar, and set away for twenty-four hours longer, then boil for one hour and twenty minutes, or perhaps a little longer. Pour into jelly glasses. This amount will fill eight glasses.

— Chocolate Creams. —

One half cupful cream, 2 cupfuls pulverised sugar. Boil five minutes, add vanilla essence to suit the taste. Roll into balls—melt as much chocolate as wanted, over a teakettle; cover the balls and let cool.

— Sardine Toast. —

Make some slices of toast, butter, and cut them a little larger each way than the sardine. Spread over a little anchovy paste, lay on the sardine, and sprinkle with parsley chopped as fine as possible. Squeeze over a few drops of lemon juice, dust over a pinch of cayenne, place in a quick oven to get very hot, and serve.

— Beef Loaf. —

Take two pounds of round steak and half a pound of suet, both chopped fine. Add two eggs, one cup of bread crumbs that have been softened in cold water, one small onion chopped fine, one-half cup of sweet milk, three tablespoonfuls of salt and one-fourth teaspoonful of pepper. Mix all together and shape into a loaf. Bake in a moderate oven an hour or more, basting frequently.

— Cocoanut Pudding. —

Three well-beaten eggs, 1½ quarts of milk, 1½ cups of bread crumbs, 1 cup of shreded cocoanut, mix all well together and season with lemon, and bake. Be careful not to bake too long or there will be whey in it.

— Apple Snow. —

This is rather a favorite dish with young an old alike. It is made by taking one-and-a-half pounds of good cooking apples, the whites of four eggs, one pound of sifted sugar, six sponge cakes, a little jam or jelly, and brandy, sherry, or raisin wine, to soak the sponge cakes. Peel, core and quarter the apples, put them into an enamelled saucepan with a gill of water and simmer until quite soft. Pulp them through a sieve into a large basin, and when cold beat with a whisk until they are all light and frothy. Add the whites of the eggs, previously beaten to a stiff froth, and sprinkle in the sugar, whisking vigorously all the time. Split the sponge cakes in half, spread with jam or jelly and arrange in a deep glass dish. Pour over sufficient brandy or wine to soak them, then pile the apple snow on—it will be quite stiff—garnish with stripes of angelica and dried cherries. Set in a very cold place until wanted.

— Mince Meat. —

Six apples, 6 lemons, 2 pounds of raisins, 1 1-2 pounds of currants, 2 pounds of beef suet chopped, 3 pounds of brown sugar, 8 ounces of mixed candied peel, 1-2 rind of a fresh orange grated, two full teaspoons of mixed spice (cinnamon, cloves, and nutmeg) and a little brandy. Peel the apples, cut out the cores and bake until they are soft, then chop. Squeeze the lemons and use the juice only. Wash the raisins and currants well and dry thoroughly then remove the seeds from the former. Shed the candied peel and chop the suet very finely indeed. Now mix all the ingredients together and stir well adding the brandy last. Press the mince meat down in a jar and place on it a piece of paper dipped in brandy. Cover the mouth of the jar with a cap of paper and store in a cool place.

— Rhubarb Pudding. —

Well butter a rather deep dish and fill with alternate layers of rhubarb, peeled and cut into inch long pieces, and thin bread and butter; put brown sugar and grated rind of lemon with the rhubarb to sweeten and flavor. The top and bottom layers should be rhubarb, and a few little bits of butter should be put on the top, and half a cupful of water poured in before the dish is put in the oven. Bake thoroughly. If eaten cold it may be turned out into a glass dish and garnished round with a little whipped cream or white of eggs whisked to a froth, like snow.

Broken Hill Poultry and Kennel Club.

SECOND ANNUAL SHOW.

— Pigeons. —

At the second annual show of the Broken Hill Poultry and Kennel Club, a fine entry in pigeons was made.

Winners in Pouters were, W. J. Hughes, H. L. Hammond, and J. Dally.. In Dragons, A. J. Arthur, J. Dally, F. O. Schultz, and P. Hallet. In antwerps, A. O. Greaves, J. S. Guidi, G. Day, and F. Shoesmith. In Tumblers, H. F. Greaves, P Hallett, R. Henwood, J. S. Guidi, S. Cockrum, W. Cowie, R. H. Hicks, C. H. Wellington, and A. D. Greaves. In Beards W. J. Hughes, R. Henwood, H. E. Greaves, W. Cowie, and P. Hallett. In Bald heads, W. J. Hughes. In Saddlebacks, H. L. Hammond, and H. Howell. In Jacobins, S. A. Tremelling. In Magpies, J. S. Guidi, P. Hallett, and R. Henwood. In Fantails, J. Dally, W. J. Hughes, F. Shaddock, J. Cullen, and D. Callaghan. In Turbits, P. Hallet. In Turbiteens, P. Hallett and S. Cockrum. In African Owls, W. J. Hughes, R. Henwood, G. Glasson, and P. Hallett. In English Owls, A. J. Arthur and H. L. Hammond. ...In Working Homers, W. Steggal, W. Dowling, W. J. Crabb, D. Callaghan, G. Glasson, A. O. Graves, F. Shoesmith, J. Dally, H. Howell, and J. Smith. In Show Homers, J. Dally, G. Glasson, and H. Howell. In Nuns, W. Cowie. In Blondinettes, C. Wellington, and W. J. Hughes. In Archangels, E. Ockleford. In A. O. V., W. J. Hughes and J. Cullen.

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Balaklava Poultry and Kennel Show.

The Balaklava Poultry and Kennel Club held their second show, at which pigeons were well represented, during the month. The following is the prize list :—

Judge, Mr. A. Flounders. Carrier, cock, W. Kirkland ; R. T. Wilson. Hen, R. T. Wilson (1 and 2). Dragon, blue, cock, C. W. Creer ; C. Nenke. Hen, C. W. Creer. Any other color, cock or hen, C. F. Chenoweth ; H. S. Gillies. Barb, cock or nen, C. Nenke ; G. Nenke. Pouter, blue, cock and hen, H. S. Gillies. Any other color, W. H. F. Hall ; C. Nenke. Hen, W. H. F. Hall. Tumbler, almond, cock or hen, and any other color, cock and hen, H. S. Gillies. Baldhead, cock and hen, L. P. E. Smith. Beard, cock and hen, L. P. E. Smith (1 and 2). Saddleback, L. P. E. Smith ; H. O. Gillies. Magpie, black, cock and hen, D. Cruickshanks ; H. S. Gillies. Any other color, cock, L. P. E. Smith ; G. F. Chenoweth. Hen, G. F. Chenoweth. Fantail, white, cock, F. French (1 and 2). Hen, H. S. Gillies ; F. French. Any other color, cock, G. F. Chenoweth ; C. W. Creer. Hen, G. F. Chenoweth ; H. S. Gillies. Turbit, black, cock, H. S. Gillies. Hen, L. P. E. Smith ; H. S. Gillies. Any other color, cock, H. S. Gillies. Hen, H. S. Gillies ; C. Nenke. Any other color, cock and hen, C. Nenke. Blondinettes, H. S. Gillies. Turbiteens, D. Cruickshanks. Any other color, D. Cruickshanks ; C. Nenke. Helmet, L. P. E. Smith. Nuns, cock and hen, G. F. Chenoweth (1 and 2). Show Homer, cock, H. S. Gillies ; C. Nenke. Hen, H. S. Gillies (1 and 2). Under 12 months, G. F. Chenoweth. Working Homer, cock, L. P. G. Smith (1 and 3) ; H. S. Gillies. Hen, G. F. Chenoweth ; H. S. Gillies. Swallow, C. Nenke. Uncommon variety, C. Nenke ; L. P. E. Smith. Hen, C. Nenke ; G. F. Chenoweth. Boys' Classes—Short-faced, G. and D. Cruickshanks. Long-faced, G. and D. Cruickshanks ; F. Higham, jun.

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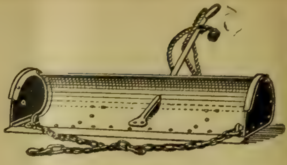
Port Adelaide Poultry and Dog Society.

— Pigeons. —

Judges—Messrs. C. von Einem and W. B. Viney. Magpies black, cock, D. Cruickshank (1 and special). Hen, D. Cruickshanks. Any other color, D. Cruickshank. Nuns, any color, cock, R. A. Stobie (1 and 2). Helmets, any color, cock, R. A. Stobie ; Miller and Martin. Hen, Miller and Martin. Under 12 months, R. A. Stobie. Jacobins, black, cock, G. S. Ball ; F. Crotty ; E. S. Lewis. Hen, F. Crotty (1 and special) ; E. S. Lewis (2 and 3). Red or yellow, cock, F. Crotty ; G. S. Ball. Any color, cock, R. A. Stobie. Under 12 months, E. S. Lewis. Fantails, white, cock, E. S. Lewis ; W. J. Hughes ; J. Loutit. Hen, J. Loutit (1 and special) ; D. M. M. Hayward ; E. S. Lewis. Black cock, D. M. M. Hayward. Hen, D. M. M. Hayward (1 and 2) ; F. Crotty. Any color, cock, J. Laing. Hen, H. G. Grey. Under 12 months, D. M. M. Hayward (1 and 2). Turbits any color, hen, L. P. E. Smith (1 and special). Orientals, Turbiteen, cock, D. Cruickshank (1 and special). Hen, D. Cruickshank. Blondinette, cock, W. J. Hughes. Hen, G. S. Ball. Any other variety, G. S. Ball. Owls, English, any color, cock, G. S. Ball (1 and special and special for best pigeon in show). Hen, G. S. Ball. Owls, African, any color, cock, Miller and Martin ; G. S. Ball. Hen, G. S. Ball. Under 12 months, Miller and Martin (1 and special) ; G. S. Ball. Pouters, blue, cock, F. Crotty. Hen, E. Hefron (1 and special) ; F. Crotty. Black, red, or yellow, cock, W. F. Hall. Hen, E. Hefron. Any color, hen, W. F. Hall. Under 12 months, W. F. Hall. Carriers, any color, cock, Miller and Martin (1 and special ; J. Laing. Hen, Miller and Martin ; H. J. Miller. Dragons, blue, cock, J. Bails. Hen. J. Bails (1 and special). Any color, cock, J. Laing. Hen, L. G. Crowe (2). Show Homers, blue or black, cock, H. Gilles (1 and special) ; F. Goodwin. Hen, H. Gilles ; F. Goodwin. Any color, cock, F. Goodwin. Hen, H. Gilles ; F. Goodwin. Under 12 months, F. Goodwin (1 and 2). Working Homers, cock, L. P. E. Smith (1 and special). Hen, L. P. E. Smith. Under 12 months, H. Gilles. Short-faced Tumblers almond colored, cock, C. Wilkinson (1 and special). Any color, cock, C. Wilkinson ; D. M. M. Hayward. Under 12 months, D. M. M. Hayward. Baldheads, any color, cock, W. J. Hughes ; W. Tucker. Hen, W. Tucker (1 and special) ; W. J. Hughes. Beards, any color. cock, W. Tucker (1 and special). Hen, W. Tucker ; W. J. Hughes ; W. Tucker. Saddlebacks, any color, stripe, cock, J. A. Sullivan (1 and special). Hen, J. A. Sullivan. Spot, cock, W. Tucker ; J. A. Sullivan. Hen, J. A. Sullivan. Barbs, F. Martin (1 and special). Hen, F. Martin. Any other variety, long-face, cock, F. Crotty ; Martin and Miller ; W. J. Hughes. Hen, F. Crotty ; G. S. Ball ; J. Laing. Boys' Class.—Any variety, long-face, cock, B. Gilles ; E. and D. Cruickshank ; Reg. Loader. Hen, H. C. Chase ; G. Hughes. Short-face, cock, E. and D. Cruickshank ; G. Hughes ; R. Loader.



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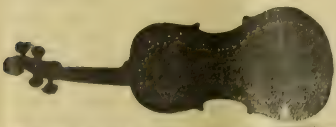

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Editorial Notices.

TO ADVERTISERS.—Alteration of advertisements should be in our hands not later than the 15th of the month.

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AGENTS.—Messrs. ATKINSON & CO. and MESSRS. GORDON & GOTCH, Ltd.

The Editor will be pleased to receive correspondence and answer questions. These replies will, for the most part, be sent by mail, unless received just prior to date of publication.

PUBLISHING DATE.—On the 25th of each month preceding title date.

DISCONTINUANCES.—Responsible subscribers will continue to receive this journal until we are notified by letter to discontinue, when all arrears must be paid.

Among the Roses.

Mildew will be giving growers a little trouble, but it is not anything like as serious now as in the autumn, when the days are changing from hot to cold.

Keep the rose beds in good "nick" by hoeing all weeds, and by an occasional raking. Avoid walking on the beds. Wet soil cakes and hardens. Anything that your foot presses should be spaded immediately.

If you have any spare manure from the fowl yards, scatter some about among the plants. It will not matter if it is fresh. Throw the droppings around, hoe them in lightly, and let the rain and the waterings break it down.

The hybrid perpetuals will now be showing nice large clusters of buds on every good shoot. If you want good showable flowers, set to work and reduce these buds to the centre one. With roses of the Earl of Dufferin type, this thinning is very necessary. The Teas and Hybrid Teas do very well without the disbudding, and unless you aim at getting exhibition blooms, or are desirous of turning out a "trimmer" to beat a neighbour, you can leave the plants to themselves.

The decorative classes that carry very loose, open flowers, will stand a lot more buds to the single stem than the full-bodied show sorts.

If you wish to secure good heads of blossom for table decoration, pinch out the centre bud of any cluster. Generally speaking, this one will flower some time ahead of those which accompany it. By pinching the centre flower out, you force all the others into bloom about the same time.

When cutting flowers for home use, or for sale, take as big a bit of stem as you can get. If the shoot is 24 inches long, cut 20 inches off it, and by doing so force the new growth to come quickly. You will always get a strong shoot after a hard cut. The long stem adds to the appearance of the flowers, and also to the length of their lives. Snipping roses with only a few inches of stem, unless for the button hole, or small vase work, is quite a waste of flowers.

By cutting on long stems you can get an extra crop of flowers into the year's work. Growers who allow their plants too much breathing time, lose a lot of roses. Cut quickly, and manure and water often. You will then carry the bushes along without a rest. Some folks think rest is necessary. Perhaps it is. We have never seen any ill effects out of forcing our plants during the season, when they are willing to grow.

It is not necessary to disbud rose plants put out this year. Let them flower, but don't allow the seedpod to remain to ripen. It is this which is a drain on the plant. Be very sure that you take away all the weak, spindly bits of stem, as well as cut all the new growths that have carried a flower very hard.

Get into the way of handling all your own rose plants, whether the work be planting, pruning, or cutting the flowers. There is ten times more pleasure in raising roses than in having the work done for you.

Liquid manure may be given to any plants that you expect to throw show blooms. Use fresh cow manure, or anything on hand, but see that the liquid is weak. Strong doses are more harmful than helpful.

Keep a look out for aphis. Hard syringing is sometimes effectual, if not spray with infusion of Quassia chips.

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"HOW'S IT DONE?"

This remark is frequently made with regard to the excellent values offered by Messrs. Henderson Bros., the well-known cash grocers, of 286-288 Rundle Street, Adelaide. The explanation of course lies in the following. The business conducted by the firm is a purely cash one, and therefore, unlike most other businesses, there are no bad debts. Purchases are made in very large quantities for cash, and in this way the best possible value is secured. The old adage "Small Profits and Quick Returns," may be said to be the motto of the business, and this, combined with the fact that goods are bought right and there are no bad debts, coupled of course, with good management, makes it possible to retail all articles at such a trifling advance on wholesale cost. Those who prefer to run accounts, and of course are prepared to pay the increased cost thereby entailed, will not be interested in the subject, but, on the other hand, those who are prepared to pay cash and desire to save money, may certainly communicate with Messrs. Henderson Bros. to their own advantage.

SOUTH AUSTRALIAN HORTICULTURAL AND FLORICULTURAL SOCIETY.

Grand Rose and Spring Show.

Pot Plants, Roses, Carnations, Annuals, Bouquets, and Floral Designs, Fruit and Vegetables.

DECORATED DINNER TABLES.

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A. H. SCARFE, Secretary.

Ornamental Grasses.

If folks would only consider the exceedingly elegant, graceful, and dainty pot plants ornamental grasses will make, if care is taken with them, these plants would be very much more popular and also very much more extensively grown than they now are.

"Ornamental grasses are an acquired taste like mangoes," I heard a well-known plant enthusiast remark lately. This is decidedly true. Many people never give a second glance at them, and therefore cannot conceive how very graceful and pretty they are. There is not any mistake about it, in their own dainty style many of them are really just as pretty and as much worth cultivating as numbers of ferns we spend so much time over. In days of yore, with what delight we hailed a well-grown pampas plant, and yet to-day, if there is one growing thing I cordially detest, it is this grass, with (to me) its aggressive plumes. Rarely, if ever, does one see it to any advantage. If used in a large room for decorative purposes, it may pass muster, but if anyone should dye it, is there anything of a decorative nature can look more awful? One great consolation is that these monstrosities burn well, and if ever one is presented with such tokens of good will from a well-meaning friend, it is a very easy matter to put them behind the fire. What greater insult can one pay Nature than to dye her products? I have even known folks dye some of the more fragile and daintier of grasses, and for such wicked acts of desecration they really should be tabooed by any plant lover.

— Soil Required for Growth. —

If pot plants are wanted of grasses, I find a much better plan is to sow the seeds direct into each pot, instead of the usual plan of seed sowing. Under this the seeds are sown into a large flat box, and then, when the tiny plants appear, they are pricked out and put in couples into six or seven inch pots. Very much better results may be obtained by sowing direct into whatever pots one wishes to grow them in. The tiny seedlings when moved seem to dwindle and wilt away almost at once. The soil these plants really seem to thrive in best is a mixture of sand, decayed manure (cow cakes preferably), and some earth from under one's wood heap. These should be mixed, and a shovelful or two of soot will be a nice adjunct to these constituents. The pots, when being prepared for the seeds, may be filled with this mixture of soil to within half an inch or a full inch of the top, and with grasses it is always well to have at least a couple of layers of charcoal at the bottom of the pots. Seeds of grasses should be most carefully sown all over the surface of the pot. Then allow fine, clean sand to drift through one's fingers over the seeds, thinly, but evenly. The very greatest of care should be taken to water these seeds with the finest rose, as otherwise they will be washed to one side of the pot. After sowing and watering lightly, a piece of glass placed over the top of the pot for a few days will cause the seeds to germinate quickly. Once the slightest vestige of the wee plants puts in an appearance, remove the glass entirely, and give the young plants plenty of air. Otherwise they will grow weak and thin. If six or eight little seedlings appear, it is a big mistake to keep them all in the pot, for if it is one of six-inch or eight-inch size, three will be sufficient to fill it when fully grown, so that best plan is to weed out the most puny plants.

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Grasses in pots always need stakes, and these should be put in most carefully. If one has three plants, put in three supports at equal distances apart, and tie a piece of stout thread secured from one stake to the other all round as soon as the grasses are old enough to require it. The pretty grassy foliage will soon afterwards grow so thickly that it will hide both sticks and thread, they will also prevent the plants from becoming untidy, for they will catch leaves in the thread, and grow into pretty, shapely plants.

— As Garden Plants. —

For growing in the open, nice clumps of the different pretty grasses do much to produce and give one's flower beds a pretty appearance, for combined with perhaps some clumps of gay-looking phloxes, delphiniums, godetias, gaillardias, etc., they give just the softening touch that is needed to tone down the excessive colouring of the flowers beside it. Grasses can easily have the soil prepared, and be sown in neat little patches. If there seem to be too many wee plants, they can, of course, be weeded out. But ornamental grasses in clumps in the open garden give really the most artsitic effect, and how useful they are for cutting to combine with blossoms for the table, mantelpiece, etc. Again, as foliage for blooms, they last considerably longer than any ferns.

— Varieties of Grasses. —

In parks or reserves, the commonly-called Pampas grass, which correctly, is known as the Gynerium argenteum, seems to be in its element. In a small garden this grass seems too over-powering and takes away any artistic or pretty effect. "The grandest of all ornamental grasses," is what one often reads of in descriptions of places where this plant grows wild. It grows to a height of six to ten feet and presents a most imposing appearance.

— Cloud Grass. —

I give the palm for beauty to the delicate, dainty-looking cloud grass (Nebulosa agrostis). This makes simply an ideal pot plant, for it is one of the lightest and most graceful of all grasses, and its panicles when well developed really look like a beautiful cloud resting over the pot. It is simply beautiful for table decoration, and, used with bright blossoms, has the loveliest effect.

— Love Grass. —

Another beautiful grass is Eragrostis elegans (Love Grass). This is a strong-growing hardy annual with broad foliage, which, with the stems, are covered with down. The grass has a sort of bloom on it, is very branching, and of a rich heather-like purple colour.

— Animated Oats. —

A pretty grass for tubs or flower pots is what we call animated oats, and bears the name of Avena sterilis. This is also very pretty for mingling with, say, the beautiful, bright, scarlet zonale geranium, or the ever popular gaillardia or nasturtium.

— The Umbrella Grass. —

The umbrella grass (Cyprus alternifolius) is strictly a sedge and not a grass; but is very pretty for decoration, and for bouquets, sprays, etc.

— Stipa Elegantissima. —

Stipa elegantissima is another exquisite grass, with very gracefully drooping flower-like spikes or trusses, and this is a delightful accompaniment to a dinner-table decoration of scarlet poppies, or even ordinary white marguerites. This grass is a perennial, and so is Stipa pennata, which is just perfect as an adjunct to a shower bouquet, which many folks call "Feather Grass." This grows to a height of about thirty inches, and the blossom-like panicles are covered with a sort of silvery down. It is a lovely grass to have in the open, or a clump or two on a rockery gives such a unique effect.

— "Tail" Grasses. —

Everyone who takes any interest in grasses knows the Squirrel Tail (Hordeum jubatum) with its pretty tuft of silky plumes of a purplish colour. Pots of this grass are exceedingly pretty for the hall or vestibule, and it looks well growing in prettily painted enamelled tubs.

The Hare's Tail Grass is only an annual, but an exceedingly pretty one with stumpy tufts of white down on stems, and this also makes a pretty pot plant, for it only grows eighteen inches high.

— Butterfly Grass. —

This is one of the most elegant of all grasses and grows eighteen inches high. It is about the only grass I like to see combined with roses, for the small silvery panicles or blooms seem to go well as a foliage decoration with the queen of flowers.

— Chenile Grass. —

The Chenile Grass, "Chloris latifolia," is very effective and pretty. For a sixpenny packet of this seed one could have a couple of dozen good pot plants.

— Fairy Grass. —

A grass that makes an ideal plant for a small tub or cask, or for growing in tha open, is what is called Himalayan Fairy Grass commonly, its correct one being Miscanthus nepalense. There are many pretty grasses which any of us could grow if we cared to devote a little time and care to doing so. For a basket plant, what is prettier than a mixture of the dainty sweet little ribbon grass, and the easily grown little Lobelia? It is the happiest combination, and does look so sweetly pretty, and yet one sees it but seldom in this part of Australia. It is very much grown in Melbourne, and a very great favourite with florists, for it is just admirable for their work. Either on rockeries or window-boxes this sweet little grass is most effective, and I venture to say used in conjunction with either deep red carnations, such as the H. plumridge variety, with its deep rich red fringed flowers, or the species known as "Ginevra" (pale pink, and delicate creamy yellow), it helps to make the dinner table exceedingly lovely.—"Currajong," in "Western Mail."

◆

Summer Flowers.

— Sunflowers. —

Seed of the annual can be planted now, either in the open bed or in boxes, the latter for preference, because then the seedlings may be transplanted the proper distance apart, say, three or four feet for the taller branching varieties, and eighteen inches or two feet for the dwarfer kinds. Their easy culture, their adaptibility to any soil or position, their floriferousness, and the length of time they remain in bloom make them the most popular summer annual grown. There is no reason why any cottager, however scant his means, shouldn't have his patch of garden one blaze during the summer months with this flower, for even if he cannot get seed from the neighbors or friends, a threepenny packet will give him enough to plant it two or three times over. In larger gardens they may be very effectively used in planting a bed set apart entirely for their use. Although not fastidious as to soil, they will appreciate some old manure dug into the ground. The perennial also can be propagated from seed planted now or in the autumn, and it is in this way that new kinds are raised. Old plants may be separated, replanting only a very small piece—nearly every piece of root will grow. They want plenty of manure.

— Schizanthus. —

This is a very pretty annual, and one that deserves to become better known and better grown. It may be sown in clumps or beds, where it is to bloom, or in pots or pans, and planted out. It likes a good, rich, sandy soil, and is improved by a bi-weekly appreciation of manure water. Like the aster and the balsam, Schizanthus retuses makes an A1 pot plant. If flowered in an eight inch pot, and fed with cow manure water few plants can exceed them in beauty.

— Sturt's Pea. —

The seed of that beautiful trailer, Clianthus Dampieri, or Sturt's Pea, may be sown now. The seed being very hard, should be soaked in hot water, and then planted in almost pure sand, either in pots or in the border where it is to grow. Put the seed in a cup, pour water, almost boiling, on them and let it cool, then sow. If sown in the border mix with the soil a quantity of sand, give it a good watering, and cover the seed to the thickness of a penny, place a zinc ring round them as a protection against slugs, and a sheet of glass over all. The seedlings will appear in five or six days, when the glass must be removed. The Sturts pea may be trained over a small trellis, which must be placed in position while the plants are young, and the training done as they grow. The soft, fleshy branches must be tied to the bars of the trellis with something soft, such as budding cotton, or else the tie is likely to cut it through. They require little or no manure.

— The Balsam. —

These beautiful annuals do best in a fairly damp situation, and that is probably the reason we do not find them often grown to perfection on the plains. But even there success with them may be attained by choosing a bed on the west side of wall or shadehouse, mulching and careful regular watering during the hot weather. Some of the balsams are very delicate in coloring and perfect in shape, resembling nothing so much as a miniature camelia. They make splendid pot plants. Use a light but rich soil—a sandy loam, enriched with some very old cow or sheep manure.

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Garden Notes for October.

The weather is still keeping up its somewhat unusual and decidedly uncertain character. A dry August with a touch of summer in the middle of it and a record hot day, 85 in the shade, to wind up with is not playing the game quite fairly, from the gardener's point of view. To-day, September 1, there is fortunately a drop of twenty degrees and more welcome still a steady downpour, which promises to once more save the agricultural and to a lesser extent, the horticultural situation by a somewhat narrow margin. Two or three rains, which are due, and may fall before these notes are in print, will make a great difference to the pleasures and results of gardening for many weeks to come.

Violets seem to have appreciated the rather dry time. We have noticed some wonderfully fine displays, great clumps in which the foliage has been almost hidden by the wealth of bloom. The old favourite Neapolitan, with its delicious fragrance and delicate mauve colouring still remains one of the best. Its white relative, Count Brazza, is probably without an equal amongst the double whites. Lady Hume Campbell is a very fine blue double which is said to be particularly hardy. Princess of Wales is a single blue, of exquisite fragrance and the plant is of vigorous habit and handsome appearance. La France is another excellent variety. For a single white there is nothing to equal White Czar. If in an exposed position violets, especially the doubles, will carry over the summer better if given some small amount of shade, small branches of evergreens stuck into the ground here and there amongst the plants will do all that is necessary. Violets are so cheap that few people think it worth while to raise them from seed but this is easily done. Sowings may be made now. It is best to sow in a seed box or bed and transplant in autumn. All violets require an occasional drink during the hot weather but not enough to force them into continual growth.

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Stock are another old favourite which have done and are doing well. Every gardener should find room for a bed of them for they are hardy, beautiful, sweet scented, bloom at a time of scarcity and continue in flower for a very long time, five very desirable points. A mixed bed or border is very beautiful, but to be seen at their best, where there is room, give each of the selected varieties a bed to themselves. If you have not already grown stocks make a note of them as one of the things to be sown from the end of next month onwards. Vesuvius, a rich red; Almond Blossom, a rosy pink shaded white; Crimson King, an exquisite crimson; and Beauty of Nice, will certainly repay anyone who grows them well, and there are many others, equally beautiful. A little liquid manure given twice a week will lengthen and strengthen the blooming. Stocks are usually propagated from seed, but cuttings of side growths, cut with a heel will root fairly well in a sandy compost, especially if given a little bottom heat. This plan is certainly worth trying where one has and wishes to perpetuate any specially fine flowers from unnamed mixed seed. Pot firmly and keep sufficiently moist.

Writing of the stock reminds one of another old English favourite, the Perennial Phlox, which is much neglected in Adelaide gardens. They like a deep rich soil and should be planted in such a position that they are not exposed to the full sun, not a shaded position exactly, rather a semi-shaded one. They are handsome, long-lived, plants, which will give pleasure for years. Seed may be sown this month, or established plants may be bought cheaply at any of the nurseries. They have a fine range of colour, from white to rose, crimson, red, almost to purple, and the big bold trusses of bloom are a great addition to the early autumn flower display. The present is a good time to dig in some rich manure around plants already in position and they will appreciate liberal watering through the summer.

When planting hedges many people are guided in fixing their distances rather by the size of the plants at the time of setting than by what they may reasonably become. Eighteen inches from a fairly open fence and thirty from a paling or iron fence is none too much, especially if the fence borders the street. Where a large quantity of plants are required it is an economical plan to grow them from seed but for ordinary suburban purposes it is better to buy pot-grown plants. Willemetia capensis, Rhamnus, Pittosporum (eugenoides and nigrescens), Coprosma lucida, all make good ornamental evergreen hedges of what may be called medium size, and seeds of any of them and others can be sown this month. Neither of the handsome varieties of Cupressus can be raised from seed.

In planting out pot-grown shrubs, etc., some people make the mistake of putting them in the earth just as they come out of the pot; others, again, pull the root system about far too much. The best way is somewhere in between. A good deal depends on the amount of roots which have developed. If they have not much more than reached the side, little more need be done than knock off the "crocking." Where there is a tap root it is well to straighten this out somewhat, even if it involves breaking the ball considerably, and care should be taken that this root is planted well down in the earth. Such roots have a rather playful habit of acting like a spiral spring, when it is extended and released, but a little patience will overcome this. Always soak the pot thoroughly an hour or two before you intend to handle the plant.

If you want to increase your stock of any specially fine snapdragons you can do so by taking cuttings of young wood and striking them in sandy soil. They quickly root under glass and soon make well grown plants.

Worms sometimes give a good deal of trouble in lawns, the best way to get rid of them is to water the grass thoroughly with lime water, about a dozen pounds to 20 gallons of water is strong enough. Let the lime settle and use only the clear solution.

Azaleas will want a little mild pruning after flowering, and when grown in pots will be much benefited if an inch or so of the top soil is taken away and replaced with equal parts of leaf mould and old cow manure.

Pansies are making a nice show, any particularly good ones can be increased by cuttings. For this purpose use only young growth a couple of inches long, put half a dozen pieces around the edge of a ive inch pot of well drained sandy soil. They will root in a cold rame or glass house, or, better still, if the pot is plunged in an old hot bed which still has some eat in it. Petunias respond to he same treatment equally well.

It is better to pinch out the oints and generally train ornamental evergreen shrubs than to lo any very severe pruning. Now hat they are putting out new rowth is a good time to attend o this. 'Tis an easy way to get ymmetrical bushy plants. At the ame time cut out any dead, dying nd crossing, or superfluous wood. Most plants of this class are improved by a little judicious opening up.

A well grown plant of Wisteria n somebody else's garden is at his time of the year a distinct emptation to covet thy neighbour's goods. It would be more o the point, perhaps, to ask him o put down a layer or two for ou. In any case make a note, nd underline it, to get one from he nursery next June. There is robably nothing to equal it for raining around a window, along a erandah or over an old tree, which s on its last legs of usefulness r beauty. If you have no room or it in either of these positions t does splendidly on a stout arch r tripod. As a last resort it will o almost equally well in bush rm.

What a glorious display the ouble flowering peach makes. It oes not unfortunately last very ong, neither do the equally beautiful plum and cherry, but whilst hey last they are a delight to very passerby. They want cutting back severely as soon as the loom is off.

Spring flowering sweet peas are oming on rapidly, see that they re not allowed to become dry. teaspoon full of sulphate of ammonia, not more than once a week ill add considerably to the show f bloom, the manure to be dissolved in a gallon of water. Several eople have told us of disappointment with winter flowering peas. o do well this class evidently requires a very well worked root ed, the soil must be free and well rained and the position an open unny one.

When you want to save seed of ny choice Ranunclus, wait till the eads have turned yellow, cut dry nd store. Sow in December or arly in the new year. They will loom next spring.

Don't forget that October is robably the best month of the hole year for seed sowing. There re very few classes of plants which cannot be sown to advantage during the next two or three weeks. Hardy annuals, of course, are sown in the autumn, but all the half hardy class, from which we get so great a part of our summer and autumn display, are suitable for present sowing whilst nearly all biennials and perennials will do well if sown now. Hedge plants and the seeds of many ornamental and useful trees can also be put in, also seed of any of the many beautiful Acacias.

Give liquid manure to roses. Use any weed killer for the paths. Get out the hose and see that it is in good order. Get an extra tap or two put in the garden if it is necessary, it is certainly good economy to do so. Weed lawns and top dress if not already done. Plant new lawns. Put out early sown seedlings of summer flowering annuals. Keep the seed boxes fairly moist and use a fine rose especially for all small seeds. Give any vacant beds another digging, you cannot work garden ground too much.

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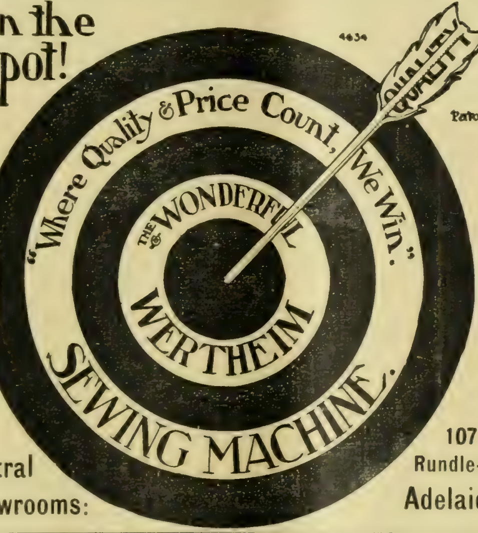

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Decorative Roses.

A paper read before the Horticultural Society of New South Wales, By G. W. Kershaw.

It is not my intention to waste much time in acclaiming the rose as the queen of flowers. Those who know her best admit the fact, for whether we take the rose for its beauty of form, innumerable and chaste variations of colour, and, in most cases, sweet fragrance; or on a lower plane, as giving the maximum return for a minimum of labour expended, the result is the same. She has no peer.

My paper is intended to deal chiefly with roses of a decorative character, i.e., those roses which have not sufficient petals to class them as exhibition varieties.

Before going further, I would like it to be distinctly understood that I yield to no one in my admiration for a perfect show bloom—say a perfectly formed and correctly coloured "Earl of Dufferin." Such a bloom with its additional charm of sweet scent, compels the love of everybody. My chief complaints against purely exhibition roses are that, in most cases, everything is sacrificed to size—colour often gone, and fragrance absent. In numerous instances also the growth of the plant is weak, as in such roses as Mrs. Edward Mawley, Duchess of Portland, Mildred Grant, and others. Take four admitted champions, and where is the fragrance? White and pink Maman Cochet, K. A. Victoria, and Frau Karl Druschki. It may sound like treason to say anything against the latter rose, and yet to me there is something cold looking about it. The beauty of form is there if caught at the right time, and the pure camellia-like whiteness is there also. It is like looking at a beautiful woman, who perhaps we know to be deficient in that kindliness of heart and sympathetic nature which go to make up the perfect woman. Offer for choice a perfect bloom of say, La France and Frau Karl Druschki to the average person, and which would be chosen? I venture to say La France. The beautiful colouring and sweet scent supply the lacking qualities.

In the decorative roses, with which we are most particularly concerned at present, we have for the most part vigour of growth, extreme floriferousness, innumerable shades of colour, and in many cases delightful fragrance. In decorative work for the home, and for made up work of all descriptions, these roses are indispensable. Being of light build they hold themselves up without much wiring, are much more quickly arranged and are more graceful in appearance. Then again when the cold, wet weather comes along, and the heavy petalled show roses are vainly endeavouring to unfold, our decoratives are all there, making a brave show under the most adverse conditions. It is at such times that their real worth is most manifest. For years past I have been advising clients to have
a goodly portion of their roses i
this class. I do not wish to fil
this paper with a lot of names, and
yet it would not serve its purpos
without naming at least a few
that I find from actual experienc
are invaluable. From an ever
blooming view-point, the list must
be sought for in the tea and hy
brid tea classes.

If a judicious selection be made
and with a little intelligent treat
ment in pruning, feeding, etc., it i
quite possible about Sydney, or i
any district where frosts are no
too severe, to have roses every
in the year. To do this it is als
necessary to have more than on
plant of each variety. By this me
thod they can be pruned at differ
ent seasons. For instance, sa
you have three plants of Rainbo
or Corallina. By leaving them
alone you will get bloom in th
usual course, from October t
July. But you want rose bloom
particularly in August and Sep
tember. The usual time for prun
ing about Sydney is the last wee
in August. If all your plants a
left unpruned till then, you are, c
course, from that time till the be
ginning of October without an
flowers. To avoid this, if yo
sacrifice the bloom on one of th
plants say at the end of May an
prune moderately, you should ge
bloom about the middle of July
treat the next plant in the sam
way at the end of June an
blooms will come in the middle o
August, and by that time the firs
treated will be throwing a secon
crop into September. This resul
is only obtainable where the win
ters are not too severe. Injur
would result to the plants s
treated where frosts and bitin
cold winds are severe, as th
young growth would be pinched o
killed outright. When pruning a
mentioned, a mulch of stable man
ure round the plant, and liqui
manure if the ground is dry wil
further help to improve quantit
and quality of blooms. The fol
lowing roses respond readily t
this treatment :—

Corallina, Papa Gontier, Cou
tess de la Barthe, Safrano, Peac
George Nabonnand, Francis D
breiul, Princess de Sagan, La To
ca, Madm. Antoine Marie, Pa
Nabonnand, Madm. Jean Dupu
Madm. Phillip Kunz, Madm. La
bard, and many others. The tw
Maman Cochets respond readi
also, and will give good results
a rather dry winter is on. But
cold wet spell will spoil any flow
buds, as the petals are too close
packed.

Now for the names of a few
my favourite decorative roses, e

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The nine cases of plants arrived perfect, not one pot broken.—M. & H., Broken Hill.
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bracing all shades of colour, and of that vigorous and branching habit so essential where roses are needed as flowering bushes in the garden. Those already mentioned are of the type; also, Gruss au Teplitz, General McArthur, Warrior, Triumph, E. M. Kershaw (reds); George Schwartz, Harry Kirk, Comte Chandon, Marie Van Houte, Amazon, Mrs. Dudley Cross, Sulphurea (yellows and creams); Countess of Gosford, Queen Olga of Greece, Killarney, Rainbow, Souv. de Madame Pernet, Countess Riza du Parc, Sylph, H. M. Stanley (pinks); Madm. Eugene Resal, Souv. de Catherine Guilliott, Souv. of Stella Gray, Edie Meyer, Grace Molyneaux, Comtesse de Cayle, Dr. Grill, Lady Roberts, Madm. Charles, Madm. Gamon, Souv. de Wm. Robinson (coppery shades), White Lord Tarquin, The Queen, La Innocence, Edmond Deshayes, and Molly Sharmen Crawford are good useful whites. Frau Karl Druschki, classed as a hybrid perpetual, blooms almost as continuously as any tea. The growth is very vigorous, and the plant requires to be kept within bounds; a light tripod is about the most effective. Coil the long canes round, and tie in at intervals. This has the added advantage of causing numerous laterals to break, all of which will produce a bloom.

There are other excellent garden roses which may hardly be classed under any of the colours mentioned. Monsieur Tillier, a rich terra cotta shade, is fine for cutting at all seasons, and a good grower. Arch-duchesse Marie Immaculata, flesh pink, coppery red centre, are instances.

Another beautiful section for decorative work is found in the singles. The set described as Irish roses, introduced by Alexander Dickson & Sons, contains some gems, the most lovely being Irish Elegance, biscuit colour; Irish Harmony, white; Irish Engineer, dazzling scarlet; Irish Star, deep red; Irish Glory, deep rose. The blooms are five petalled, and all except Engineer are carried on long thin stems. They last a considerable time in good condition when cut fresh. For some years there seemed to be a general impression that they were only spring bloomers, as a matter of fact they are in bloom quite eight months of the year.

Some of the very qest decoratives are also to be had among the rambling class. Dorothy Perkins, rose pink; White Dorothy and Dorothy Dennison, flesh, are exquisite. Their long, pliable stems are easily trained into any position. Their natural tendency is to run along the ground, and for this reason they are invaluable for quickly covering banks, rockeries, etc. The one objection with some people is, they are spring bloomers only. If used with other free flowering climbers and let run with them, this fault is not so noticeable. The glossy foliage is almost evergreen. Sinica Anemenoae, a beautifully soft pink shaded with white, makes a handsome pillar or tripod, or may be trained as a climber, and blooms frequently. Rosa Lavigatea, a charming single white, glossy foliage, very vigorous rambler, makes a grand display in September and early October. Blush Rambler, one of the very best, is not nearly well enough known. Flowers are produced in large trusses, apple blossom in colour. Spring bloomer only, but the plant is covered with flowers for several weeks, late in September, and well into October.

The three ramblers Aglaia, yellow, Euphrosyne, pink, and Thalia, white, make pretty objects in early October, but the trusses of bloom drop quickly when cut. The dwarf Polyanthe type are invaluable for small vases, bouquet, and button hole work, the two best perhaps, being, Perle D'Or, and Madam Cecile Brunner on account of their perfect shape. For a dwarf edging in front of a border round a bed, or for massing, nothing could be more effective than Madame N. Lavavasseur, a crimson. The beautiful new variety, Orlean's Rose, is crimson with a white eye. The growth is dwarf and bushy, and the plants are covered with bloom for several months. Speaking of roses as objects of decoration in the garden, it seems a pity that some attention is not given generally to massing for colour effects. Another prevailing fault is not having several plants of extra useful varieties. Frequently in the home a certain colour is needed, and where only one plant is grown sufficient blooms for the purpose can hardly be expected.

In conclusion I am pleased to notice that of late years there is an increasing tendency among the public to plant the class of roses treated on in this paper. A word of caution is also necessary regarding the pruning of decorative roses. Beware of the man with the saw and the secateurs, who treats all roses alike. Decoratives do not require such drastic pruning as exhibition varieties. Many of these mentioned will grow to 6 feet in height, and as much in diameter. There is no sense in cutting these roses down into the old wood each year. Time enough for the saw when they outgrow the available space.

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(Signed) C. J. FRANKS.

That kidney disease is one of the most sure, but deadly, of the diseases affecting these vital organs of the body, is proved by the large number of deaths resulting yearly all over Australia. Therefore, it is best always to keep the kidneys well by use of this medicine with a few doses weekly. Also for Loss of Sleep, Biliousness, Sick Headache, Nerve Breakdown, Sluggish Liver or Low Spirits it is unequalled. All chemists and stores sell it.

Lilies.

There is no doubt that South Australian gardeners make a mistake in neglecting as they do, this very beautiful family of flowering plants. There are few things to equal the lily tribe, for they have, in a marked degree, beauty of colour, form, and fragrance. Add to this that they are hardy and that their care and cultivation entails less time and labour than many plants which do not possess a tithe of their stately beauty and the indifference with which they are regarded is more than ever surprising. There seems to be only one explanation and that is that one of the prime requisites of their treatment has been very generally overlooked, for lilies are essentially of woodland origin and consequently in their native homes have been accustomed to a cool, deep root bed, rich in humus and to more or less shade overhead, but neither of these desirable conditions—from the lilies point of view—can be said to be commonly characteristic of Australian gardens. An objection to some of the less plentiful varieties might be taken on the score of expense, but this only applies to a few, and in any case one cannot legitimately grumble at paying a couple of shillings for something that will grow and multiply for years, and yet be willing to pay the same amount for a packet of seed, the results of which will be over and done with in a few months' time.

To return to the first difficulty—shade. To overcome this is not an impossibility by any means, a light overhead lattice can be simply and inexpensively rigged up. Just something to break the glare of the mid-day sun and even that is not necessary where there is some choice of position, as for instance, where a tall shrubbery or building to the north and west tempers the solar heat. It is not so much that the plant itself will not stand the sun heat but that the baking of the earth, if this is allowed, will destroy the bulb or so weaken it that success is quite out of the question. This difficulty can be met by frequent stirring of the ground, the growing of a thick carpet of surface rooting annuals or by a fairly thick mulch of some light material. There is one other point to be considered by the would-be successful lily grower, and that is that they will very much appreciate a position protected from strong wind, the taller growing kinds cannot stand it and the dwarfer sorts do not like it. Given reasonable care in the matter of the two or three little peculiarities mentioned, there is no fear that any of the lily family will fail to return a very generous reward of bloom and beauty.

— Soil and Planting. —

Any good deep well drained garden soil will grow first class lilies. If the ground at one's disposal is not of this character, a bed or trench at least two feet deep should be taken out, the length and width, of course, depending on the number of bulbs to be planted. Put in six inches of drainage and then replace the soil taken out with better stuff, some sound loam to which some sand, leaf mould, or a little very old cow manure has been added will do excellently. If you have not such material on hand either get in a load or two or do the best you can. A good lot of decayed or decaying leaves (the more decayed they are the better) will help out a very indifferent soil and will suit the lilies almost as well as the best. Let the bed settle for a few days and then set the bulbs. When you come to this just bear in mind the importance of deep planting, not less than six inches from the top of the bulb to the surface of the soil. In a deeper dug bed the depth of the bulb might be increased up to another six inches for the larger varieties. As to distance apart this also will depend on the particular lily you are planting, from 18 inches to 30 inches should be about the range. A good layer of sharp sand under and around each bulb will certainly be helpful and any specially good (not manured) soil you have should be placed over it, this will make good foraging ground for the roots which will develop from the growing stem. This stem will soon make its appearance above ground and subsequent treatment will be in the line of hoeing (not too close to the stem, for young bulbs may be forming there), mulching, staking and watering. Lilies must never be flooded unless the drainage is perfect, but on the other hand, it is fatal to let the ground dry out. After flowering and the dying back of the stem, the bulbs should be ripened by removing the mulch and loosening the surface. They may either be left in the ground or raised for the winter. If left, the following and succeeding years will show an increase of stems from the offsets put off by the mother bulb, and from young bulbs from the stem. If lifted these additions to one's stock may be planted in a reserve bed till they reach flowering age., i.e., in two, or three years' time.

Of all lilies Japan has contributed what is probably the finest of the tribe in the magnificent Lilium auratum, the Golden-Rayed lily of Japan. Its colouring of white chocolate and gold is delightful, whilst the number of flowers borne on the tall stems gives to the plant a regal appearance, even if it falls considerably short of the 50 to 100 blooms on 10ft. stems, which have been reported. Half that height with a dozen separate flowers will satisfy most people. Another native of Japan is L. speciosum magnificum. This is the largest of this class, very erect and the blooms are said to be of a beautifully rich colour. A height

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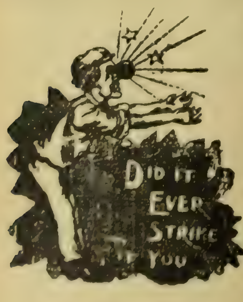
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of seven feet with 30 blooms to the stem was reported in one of the Melbourne papers a while ago.

Speciosum alba and S. rubrum are respectively white and white lashed with crimson. L. Longiorum, the Bermuda Lily, is one of the most fragrant of all lilies and its pure white, trumpet-shaped lowers are hardly exceeded in beauty by any other of the family. The Tiger Lily, scarlet spotted The Tiger Lily, orange spotted with black; and the Double Tiger Lily are all amongst the most handsome of garden plants. L. Gigantum is said to be the tallest of the family, this variety is white-lowered. L. Elegans is a dwarf and bears bright crimson blooms n great abundance. There are several other lilies distinct and beautiful but the foregoing are all well proved varieties with which the beginning of a really representative collection might be made.

There are also a number of so-called lilies but they are so only by name and not by nature.

— The Scarborough Lily. —

Vallota purpurea is one of the finest of autumn flowering bulbs, the large cup shaped blooms are brilliant scarlet. A strong but well drained soil in which it can remain from year to year are conditions which suit it best. If grown in a pot or tub do not over pot and do not repot except when necessary. A somewhat lighter soil is sometimes recommended for pot work but the Scarborough Lily s willing under almost any conditions if only its roots are left undisturbed.

— The Golden Lily. —

This is a native of China and one of the most beautiful. Its botanial name being Lycoris Aurea. The flower spikes appear before the leaves and each bears an umbel of beautiful golden yellow flowers. They like plenty of heat and a heavy clay soil also suits them. They are very hardy but flower better under those conditions. Lycoris Radiata is the Japanese spider lily. In this species the flowers are a rich crimson. Both are well worth a place in any collection of bulbous plants.

— The African Lily. —

Agapanthus Umbellatus, better known as the African Lily, is of easy culture and quickly makes a bold showy plant. There are several varieties, blue and white flowered, also a double flowered blue. One member of the family has distinctly striped leaves which give it a very handsome appearance. Unlike the true lilies they like a sunny position. They require plenty of water when they are making growth.

— The Mexican Tiger Flower. —

There are several varieties of Tigridias, all distinguished by the beauty of their open cup shaped flowers. T. Pavonia carries a particularly handsome bloom, scarlet spotted with orange. T. Conchiflora, not so well known, is yellow in petal and cup with scarlet markings. T. Alba, is, as its name indicates, white, beautifully spotted with a deep rich red. The Tigridias should be planted where they are to remain as they do not stand lifting. A sandy soil which can be kept well moistened is the position which suits them best.

— The Tuberose. —

These delightfully scented, pure white blooms, though well known, are not as largely grown as they should be. The name is rather deceptive and appears to have no meaning for the flowers are more of the lily pattern than the rose. They may be grown as pot plants or in the open, in the latter case they like a position of partial shade during the more sunny hours of the day. If grown in pots, give them sufficient room, use leaf mould and sand as a potting material and when the flower spikes show they will appreciate a little liquid manure once a week.

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The Rose Show.

October is the month of Roses and the beauty of the Queen of Flowers finds its highest expression in the magnificent collection of roses which, from year to year, are staged by exhibitors at the annual exhibition of the South Australian Horticultural and Floricultural Society. This year we are enjoying the promise of an exceptionally good rose year and there is no doubt but that if this continues the growers of Adelaide will place on the tables at the Show as fine an exhibition of bloom as the heart of the most enthusiastic lover of beauty and fragrance could desire. An excellent and liberal arrangement of classes in roses and other sections has been made and we may be sure that the staging and management will leave nothing to be desired. Probably the only weak point about the forthcoming show will, as usual, be the attendance, for it is a somewhat serious reflection on the taste of the ladies of Adelaide that whilst they will rush a bonnet show in hundreds and crowd Rundle Street to enjoy the artificial beauties of the Rag Palaces, their numbers, on the same afternoon, at an exhibition of some of Nature's choicest gems may be counted by dozens. A number of attractive special prizes are offered, details of which, as well as all other information, appear in the schedules which may be procured as indicated in the advertisement appearing on the first page of this issue.

HERE IS A LETTER WITNESSED BY A JUSTICE OF THE PEACE, ALL WEAK, ANAEMIC, OR VITALITY EXHAUSTED WOMEN, SHOULD READ. IT TELLS THE STORY OF A WONDERFUL CURE.

A Hobart Citizen Thanks Clements Tonic for Saving Her Life, and writes thus :—

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Clements Tonic is to me a remedy of most marvellous powers, the most wonderful medicine known.

I have been 28 years in business in Hobart; 24 years ago I was operated on for Hydatids of the Liver, which led to continuous ill-health. Like a sick woman will, I tried doctors and medicines, which, failing, I resorted to advertisement medicines uselessly.

I suffered as the result of the operations from LOSS OF MEMORY, NERVOUS BREAKDOWN, DIZZINESS, as well as CHRONIC INSOMNIA, or LOSS OF SLEEP, POOR APPETITE, and INDIGESTION. I could not walk across the room, I was so weak, I thought I would never see my business again.

Seeing Clements Tonic advertised, I tried it, finding it giving me appetite and better nervous strength. This is the result :—To-day I am alive and well. Although this happened 24 years ago, I am here in the flesh to-day, thanks to that splendid medicine, which cured me of the ailments specified in this letter, NERVOUS BREAKDOWN IN PARTICULAR. I had no more sleepless nights, and in a few weeks after I was strong and well, and used to rise as happy as a lark. Dozens of Hobart citizens know these words are true.

I always recommend Clements Tonic, because I know what its use means for women. Use this letter in the cause of suffering humanity.

(Signed) (Mrs.) MINNIE NIETOM.

Witness — F. Fowler, J.P., Enmore, N.S.W.

Clements Tonic may be described as twin brother of health and strength. Send for it to your nearest chemist or store. They all sell it for the public need.

The Aster.

This half-hardy annual is one of the finest and most beautiful of all the summer and autumn flowering sorts. Few things can exceed in loveliness of chaste beauty and exquisite coloring beds or borders planted with the numerous kinds of choice asters.

The seed may either be sown in boxes or pans, or in the bed where they are to bloom. If the latter course is to be adopted dig the bed selected deeply and incorporate with the soil some old, rotted manure, some leaf mould, and some sand. The bed would be all the better if turned over a couple of times before being planted. Rake the surface fine, water with fine-rosed can, and sow the seed thinly, mixing it with some dry manure or ashes in order to do it more evenly. They are sure to come up more thickly in some places and too thinly in others, but this can easily be rectified by thinning out to 6 or 8 in. apart where they are too close together and transplanting the "thinned out" seedlings in places where they have not come up thick enough.

Aster seed usually germinates very easily and most failures can be accounted for by too deep or too light covering. The best thing to cover them with is sifted manure, placed over the seed to a depth of a shilling. These showy annuals are nearly always given a position in the open border but when grown as pot plants they are quite as satisfactory as the cineraria, and easier of culture. One advantage the pot-grown aster possesses over the one grown out of doors is the length of blooming time. Very often this period is cut short outside by hot winds and other unfavorable conditions which pot-grown plants may be protected from.

Buy seed of first class strains, and don't begrudge the extra 6d. or so you will have to pay for for them—you won't be sorry when they bloom. Fill a seed pan with leaf mould and loam, mixed with a little sand which has been through a sieve of half-inch mesh, and cover lightly with sifted, short manure or some fine soil, and keep the surface damp until they are up. Prick the young seedlings out into boxes or pots containing a similar, but slightly richer, soil than they were raised in. This should be done as soon as they can be conveniently handled. When the young plants have attained a height of about 2in. plant them out into the pots in which they are to bloom. Three in a 10in. pot, or one in a 5in. will be found the most convenient to use. Keep the plants going and give plenty of air. If kept in too close or too shady a position they are likely to be attacked by aphis.

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Carnations from Seed.

Propagating Carnations from seed, which can be sown this month, is a most fascinating employment, which, when once taken up, is seldom relinquished by the amateur. By this means the best varieties are raised. The very best seed should be procured. Unless this is done a large percentage of the plants raised will be found to be useless. The seed should be sown in boxes or earthenware pans and are best under glass. They must be properly drained and filled with fresh sandy loam to within an inch of the top, making the whole tolerably firm and level before sowing the seed.

It is a good plan to roast the soil in which the seed is to be planted; this will kill the seeds of weeds, and also destroy the eggs and larvae of insects. One of the the easiest ways to do this is to light a fire in the yard between some bricks, and over this place a sheet of iron; on this the soil may be placed, and when sufficiently heated may be replaced with more until the required quantity has been obtained.

As most of the seeds will germinate it is time well spent if the seeds are put in singly and at the same distance apart. Slight indentations may be made in the sand with the tip of the finger, but only to the depth of one-eighth o an inch, and in these the seed ma be placed. Then cover very lightly with a little finely sifted sand, and water with a sprayer so as not to alter the positions of the seeds. To keep the whole uniformly moist a sheet of glass should be laid across the pan and kept there until the seeds have germinated, after which the glass may be removed and the pan placed in an airy position near the roof of the house.

It is not really necessar that one should be in possession o a glass house in order to raise seedlings. Good results may b obtained by sowing in boxes in th open and shading with a sheet o glass, raising the glass slight when the seeds have germinated, and gradually doing away with i altogether some time before planting out, which should be done as soon as the plants are larg enough to handle. The bed for th reception of the seedlings should b carefully made up of sandy loam with which has been mixed som finely-sifted, well-rotted, stabl manure.

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Rust and Spot on Carnations

Bordeaux Mixture plus good cultivation will, to a large extent prevent these diseases.

The application should be mad upon the first appearance of th disease, or even before, if ther is much danger of its presence, an repeated at occasional intervals.

Instead of the liquid mixture which it may not be desirable t use on plants in blossom, a dr preparation is used by som growers. It is made as follows:— "Six ounces of sulphate of coppe dissolved in three or four gallon of boiling water, stirring till thoroughly dissolved. With this liqui and just enough added water, dr slake one bushel of lime. To d this damp a tight wood box, an put in a layer of the lime, an sprinkle with the copper solutio till it falls into a fine dust. Pu in another layer, and sprinkle, an continue till the bushel of lime i reduced to a dry powder." Thi powder is to be dusted over th foliage. Sulphide of potassium 1oz. to 10 gallons of water is mor simple, and has also been successfully used.

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The Orchard.

What is Grafting?

At this time of the year the art and practice of grafting is brought to the minds of very many fruit growers only a few of whom, however, have more than the most elementary idea of what actually takes place. It may with some truth be argued that as long as the end sought for is attained the means by which it is accomplished is one of no importance. In other words as long as the two pieces of wood stick together the manner of their doing so may be regarded merely as a subject of speculative scientific interest. It is common to speak of the union of the two parts, yet they never truly unite, of their knitting together yet this idea is equally mistaken. If this is so, one naturally asks, how is it that the one influences the other, as they certainly do, if there is no true union. This question of the inter-relationship of stock and scion is undoubtedly one of the most interesting of the many as yet unexplained problems of horticulture. We know that the same sap, for instance, equally nourishes the quince root and the pear top grafted to it, but why it should do so and why the change takes place at a certain clearly defined point is largely a matter of speculation. The following extracts from an article by F. A. Waugh, author of a number of books on fruit culture, though they do not answer the questions raised, certainly clear the ground for a fuller understanding of the subject. If we are not told the secret of what grafting is we are at least better informed as to what it is not:—

" How do stock and scion unite in the growth of a graft? The short and easy answer is that the two grow together. The common idea is that the two pieces grow fast to one another, just as two pieces of bone grow together when they heal after a healthy boy breaks his leg. There is a notion further that both scion and stock produce new tissue, and that these new tissues commingle or coalesce in some way; but this speculation is even more vague than the primary one which leads to it.

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In ordinary graftage, where the scion is a cutting of hard, ripe, one-year-old wood and the stock is a dormant stem or root, it is, on the face of the proposition, impossible that the two should unite. Disregarding for the moment the very thin (though very important) cambium zone, the stock and scion are made up wholly of dead wood and bark. With perfectly negligible exceptions the cells are all dead—totally and forever dead. It is absolutely impossible for them to grow or to unite with anything. One might as well talk of making a lead pencil unite with a pen holder or a neckyoke with a swingletree. The two may be glued together, tied together; but they can never unite.

It is said sometimes that the cambium layers of stock and scion unite. This is quite a different matter, and though in the sense in which it is usually presented, the statement furnishes no explanation of the process, it leads us in the right direction. This thin sheet of cambium, lying between the bark and the wood, is the only portion of a tree stem which is really alive, the only portion which can grow, and so, necessarily, the part to which we must look for the beginning of the graft union.

If, now, we examine a successful graft of several years' growth, we shall at once discover two important facts: First, the one already propounded, that the old scion and stock have remained totally distinct and separate, without the slightest promise of a union; and, second, that the new wood which has grown since the graft was made is continuous. It is in complete, continuous, unbroken annual layers, like those in an ungrafted stem. At any rate, the difference between these annual layers as they grow over a graft junction and as they grow on an ordinary stem is not an essential one. It may be set aside for the present, but will be examined later.

We have thus demonstrated the following simple facts:

(1) Stock and scion do not unite like the two parts of a broken bone. On the contrary they remain forever separate.

(2) Neither do the annual layers produced after grafting unite, in the ordinary sense of that term. Each layer, under normal conditions, is complete and continuous.

(3) In hardwood graftage, therefore, the " union " of stock and scion is quite different, in its mechanical nature, from what our common speech would signify and from what it is commonly understood to be.

These conclusions are so simple and obvious that we are slow to admit their revolutionary character. Moreover, they are immediately followed in the horticulturist's mind by a train of questions and doubts which, though entirely subsidiary, do much to disguise the force of the main facts. The horticulturist knows, for instance, that the two varieties brought together by graftage retain their characteristic qualities unmodified, or only slightly changed. If a pear scion is grafted on a quince stock, then any bud above the junction will bear pears, and any bud growing from below the junction will bear quinces. There must be a division between the two kinds of wood. What is the nature of this division? How precise is it? Is it accompanied by any mechanical strength or weakness? These and other similar questions press for answer.

It cannot be said that we are yet in a position to answer all these questions. Possibly we can throw a little light on some of them. But it must not be forgotten that all these considerations are entirely above and beyond the more fundamental conclusions already reached, and that the facts already developed are not to be in any wise affected by the discussion of these questions which we now take up.

—The Separation of Characters.—

If we make sections of a large number of grafts, we find that, in spite of the continuity of the annual layers, there is sometimes, at right angles to them, a visible line of demarcation between the wood grown from the scion and that grown from the stock. The two kinds of tissue are sufficiently unlike that the difference can be noted with the naked eye. Moreover, in some cases there is a distinct line which seems to form a boundary between the two members.

One would naturally expect that a microscope having a sufficient magnification to show the individual cells of which the tissues are made up would quickly exhibit the manner of their conjunction. However, after having studied a large number of such specimens under the microscope, the writer is compelled to report the results disappointing. In nearly all cases one can see less with the microscope than with the naked eye.

In photographs showing the microscopic anatomy of the tissues it is harder than ever to see where for instance, a certain tree ceases to be cherry and begins to be plum. The cells are so indifferently mixed that one is tempted to believe that the specific physiological character may be blended at the same time. It has long been the dream of gardeners to produce new kinds of plants by the graft union of diverse scions and stocks. Do not our present observations show the reasonableness of such endeavours?

Certainly not. No matter how closely the two kinds of cells may lie against one another, their contents are never mingled in the production of a new cell. Each new cell is produced by the division of some older single cell, never by the fusion of two parent cells. Conversely stated, each cell is the offspring of one parent only, not of two; and it will therefore have the qualities of one parent only.

The two kinds of tissue may commingle or lap in together somewhat along the line of junction, but this mixture is only mechanical, not physiological.

— Mechanical Strength of the Junction. —

There has always been a good deal of debate among horticulturists as to the mechanical strength of a graft. Some have said that the graft always presents a point of weakness in the tree. Others have denied this, and have even said that the place where a graft has healed successfully is the strongest point in the stem. The materials which we have here in hand enable us to put this vexed matter in its proper light.

It will be noticed that the region about some grafts is more or less swollen by the deposition of an extra amount of wood tissue (due to causes which we need not now discuss), and that the wood in this region is very close grained, as may be seen on careful examination. In some cases when grafts are cut open and dried the tissues crack or check more quickly at other points than at the graft junction, showing that the fibres are stronger in the latter region. It may also be observed when a wind breaks off branches in an old orchard that many, usually a majority, of the fractures occur, not where the grafts have been made, but elsewhere on the same stems, a fact which shows conclusively that the grafts are not points of weakness in those particular cases.

On the other hand grafts do sometime break, even after they have grown, in apparent health, for a number of years. When a branch breaks at the point of graftage it is prima facia evidence that that was the weakest point in that particular branch. If the normal union of scion and stock is made by such complete and continuous cylinders of annual growth, how can we account for the unsuccessful unions?

The answer is not altogether an easy one. We may approach it by saying that, when the two members are unlike in nature and in some way physiologically incompatible (whatever that may mean), the wound does not heal readily, owing to some sort of irritation which continues to be felt at this point.

After a close study of a large number of these defective unions, the writer has reached the opinion that they are almost always due to the incompatibility of stock and scion, as referred to above. It is a common notion among horticulturists that careless or ignorant manipulation—the defective setting of bud or scion—in the grafting will lead to these poor unions. There seems to be little ground for this opinion. If the stock and scion are of varieties which are congenial, and if the graft or bud grows at all, the union will nearly always be good. Poor manipulation will often cause the failure of a large percentage to grow, but it seldom affects permanently the strength of the union in those grafts which live at all.

In conclusion we may re-state briefly the points developed:

(1) In hardwood graftage the scion and the stock never grow together.

(2) Neither do the new layers of wood grown from the scion and stock respectively unite. Instead of this, under normal conditions, they are produced in perfectly continuous layers.

(3) In the case of perfect unions the continuity of the new growth is more or less interrupted by the deposition of a certain amount of loose scar tissue such as serves in the healing of wounds.

(4) These conditions make the graft union mechanically weak. All degrees of mechanical strength may be observed in graft unions, ranging from those (a large number) which are stronger than the adjacent parts of the same stems down to such as are incapable of even holding themselves in place.

(5) Incidentally it has been judged that weakness of unions results nearly always from physiological incompatibility of the scion and stock, and very seldom from faulty manipulation in the original setting of the graft.

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Potatoes.

Considering how important, or, at all events, how frequent an article of diet the potato is in most households and the very indifferent quality of the ordinary market sample, it is rather surprising that more are not grown for home use by those who have the necessary space. We cannot all grow potatoes equal to the magnificent tubers which were on view at the show last week, but every amateur gardener ought to be able to produce something more appetizing than what the average green grocer has to offer. Extra good potatoes are the result of good gardening, i.e., good soil, good seed, and good care. Just casual gardening will give equally casual and unsatisfactory returns, whether one is growing a costly orchid or this humble but useful vegetable. First, as to soil. Any good light loam, and most garden soils are more or less of this character, will grow good potatoes, as long as it is or has been recently deeply dug, i.e., at least two spits deep. If the only ground one has is clay, or even a stiff loam, it can be lightened with sand, wood ashes, road sweepings, etc. If too light it can be strengthened, though this is a more difficult and lengthy process. It any case, soil which is almost on the verge of pure sand can be made to grow very excellent potatoes. For preference, choose a piece of ground which has been deeply dug and well manured, say, for a crop of cabbages, and has since been roughly dug and weathered. To each rod of this take 3lb. of superphosphate and 1½lb. of sulphate of potash. Sow this manure over the ground evenly and it is ready for planting. If you are using stable manure let it be short and fairly rotted, and use at the rate of 2 cwts., i.e., about four barrow loads to the same space. The seed should, of course, have been prepared beforehand. To do this select large tubers of even size, sound, and free from blemish. Medium size seed may be best for large growers for market, but for the home garden stick to the big, good-shaped stuff. Lay these in a shallow box or boxes, with the rose end up. If planting is to be done soon store the boxes in a moist, warm place and cover with bags. Under these conditions the tubers will soon put out sprouts. Look these over in a week's time and rub off all but two or three at the end. When these are an inch or so long remove the covering and let the sprouts harden a little, the tubers are then in the best possible condition for planting. Try to get a few thick stocky sprouts rather than a number of thready ones. When planting turn over a spit along one side of the plot, leaving a trench, in this trench lay the potatoes, about 12 inches apart, rose end up, and when doing this rub out any buds which have started since the first overhaul. If the plot is to be mulched it will be quite sufficient if the sprout is 2 inches under the surface; now dig another spit, turning it over the seed as you go on, and continue to do this till the plot is finished. The rows of seed should be at least two feet apart and should be set with a line. If necessary give a watering and spread some mulching material over the plot. When the sprouts show above ground give a dressing of ½lb. of sulphate of ammonia dusted over the plot. Following this keep the soil stirred and gradually worked towards the rows. When the tops are half grown another dressing of ammonia will be beneficial. By this treatment, working with clean seed and giving sufficient water to keep the plants in active growth each plot of this size should return at least from half to a full cwt. of first class potatoes.

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The Sweet Potato.

Though not very generally grown in South Australia, large areas are cultivated in other parts of the Commonwealth, principally, of course, in Queensland, the Northern Territory, and North West Australia, for Ipomea batatus, as it is botanically called, is a native of tropical regions. In very warm countries it is a perennial, but the slightest frost kills it. It is probably growing in popularity, though somewhat slowly. It should certainly be one of the occupants of every home kitchen garden, for it is of easy cultivation and gives a large return of food for the space occupied. It is not likely to take the place of the ordinary potato on the family table, but as an agreeable variety it would, if better known, be much more generally used and appreciated. As mentioned its cultivation is very simple, a tuber placed on a hot bed or in a cold frame, or, if the weather is sufficiently warm in the open ground and covered with two or three inches of sand will put out shoots which, in turn, will develop roots; these slips, or "draws," as they are called, are separated from the parent tuber, without disturbing the latter, and planted in their growing quarters, any such plants should be planted a little deeper than they previously stood. The mother tuber will continue to put out these shoots which may, in turn, be transplanted. For convenience, large tubers may be halved lengthways and laid flat side down in the propagating bed. Another method is to allow these sprouts to develop into vines and use these as cuttings, either setting them in pots to root and harden or, later on, striking them in the growing beds. A few pounds of mother tuber will give enough "draws" to plant a large bed, whilst if allowed to grow there would be cuttings enough to do a very much larger area. Another, the most simple method of all, is to buy a pot of rooted cuttings from a nurseryman and set straight into a prepared bed. This bed should be well dug, not necessarily very deeply, but the soil must be got into a loose, friable condition, sand, ashes, and sweepings help towards this. Some old manure should be dug in but except for its demand for potash the sweet potato is a moderate feeder. For this reason wood ashes are particularly valuable in making up a bed for sweet potatoes. A convenient size for such a bed is three to three and a half feet wide and it is all the better for being a little raised, in this the plants can be set in single row at about 18 inches apart. To those who have not grown or tasted sweet potato it can be very confidently recommended as one of the new things to try.

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CURRIE STREET.

Liming the Soil.

(Continued from September Issue.)

— How Often should Liming be Practised. —

The following answer to this question is quoted at length from the Bulletin already referred to:—

"The frequency with which liming should be practised depends upon several conditions. For example, upon the character of the soil, the quantity of lime employed in each application, the number of years involved in a rotation, the plants to be grown, and their order of succession. Formerly, in England, large quantities of lime were usually applied at somewhat rare intervals, but there and elsewhere at the present time the preferable practice seems to be to use small amounts applied more frequently. As a general rule, it may be stated that from half a ton to one and a half tons of lime per acre applied every five or six years is sufficient. There may exist extreme soils requiring either more or less than these amounts. If soils which are quite acid and have not previously been limed are to be seeded, with the intention of allowing them to remain in grass for several years, as much as two or three tons of lime per acre may be advisable. Only very extreme cases would call for larger applications. If in a rotation covering a considerable number of years two crops especially benefited by lime are introduced at about equidistant intervals of time, it may be advisable to lime twice in the course of the rotation, each time just prior to their introduction. In renewing acid pastures and meadows it is usually preferable to apply a fair amount of lime upon the furrows when they are first ploughed, so that they may be thoroughly mixed with the soil by subsequent ploughing and harrowing, and just prior to seeding to grass make another generous application.

"Lime in the form of carbonate of lime, as in marl, wood ashes, etc., can usually be applied with safety in the spring or at any other season of the year; but autumn is always the safest time to apply caustic or slaked lime. The latter form changes gradually into carbonate of lime, which is not caustic, upon exposure to the air, but usually a considerable quantity has not yet reached that stage when applied, and it may in consequence act too energetically. This is particularly true if the soil is light and sandy and if plants, which are but little helped by lime, are employed. On very acid soils, particularly such as contain much humus, there is little or no danger from applying reasonable quantities of lime in the spring. If caustic or slacked lime is applied in excessive amount it may not only injure plants directly but also indirectly by rendering the texture of the soil unfavourable; it may also make the soil temporarily so alkaline as to interfere with the activity of the organisms which transform ammonia into readily assimilable nitrates. Injury thus arising can not ordinarily be of long duration, for the reason that the carbonic acid of the soil changes the caustic lime rapidly into carbonate of lime, and thus the alkalinity of the soil is soon reduced."

— How to Apply Lime. —

Though some advocate spreading the lime on the ground before ploughing, this has two disadvantages:—

(1) The lime gets at the bottom of the furrows, and as its tendency is to work down, it may be quickly carried away from the surface soil and beyond the reach of plants.

(2) It is not readily distributed throughout the soil, and so does not come into sufficiently intimate contact with the organic matter of the soil to effect its decomposition.

The best plan seems to be to spread the lime on the ploughed land and then harrow in. A most important point to be observed in applying lime in all its forms is to mix it with the soil as thoroughly as possible, the finer the particles the better being the result.

For slaking caustic lime on the ground, about three buckets of water should be sprinkled over each cask of lime and then heaped over with soil. In a few days practically the whole of the lime will be in a fine condition suitable for spreading. One plan often employed is to place the burnt lime in piles of 30 or 40lbs., each at suitable intervals (heaps of this size 20ft. apart in each direction equals about two tons per acre), and cover the piles with moist earth. Where slaked lime is used it should be harrowed in immediately after spreading. If exposed to the air too long before harrowing it is liable to cake and form a sort of mortar so that it becomes impossible to mix it with the soil.—W.A. Journal of Agriculture.

Physical Properties of Orchard Soils.

In a previous article we disissed various soil properties, ch as weight, adhesive properes, the retention and diffusion of oisture, together with capillarity nd evaporation. We shall now ave a few words to say on the fluence of heat on soil condions.

The contraction of the soil by rying is a property which is exted in proportion to the power f absorbing water. Some soils, ch as clays and peats, diminish t bulk by drying very considerbly. Clay soil shrinks about 25 er cent. of its bulk in drying, eat about 50 per cent., while a andy loam loses scarcely anyhing. The more clay or vegetable atter the soil contains the more contracts, and the cracking of he surface thus occasioned is often eriously injurious to the roots of rops, rupturing the roots as the ssures open. A strong clay soil as been known to be fissured in his manner down to the drains at depth of 4ft., so that the next ain poured down into the drains floods without soaking the surce. This property of clay land one of its disadvantages, which hould be noted, and should enourage its improvement by a coniderable admixture of vegetable atter, which will add to its orosity and make it less subject o an injurious evaporation.

— Porosity. —

The relation of the soil to the tmosphere, in regard to its phyical properties, is a part of this ubject which should not be nelected, for the power of absorbing aseous substances from the air of great importance to the rowth of crops. The absorption f oxygen by porous substances is ell known, and the more porous oils exert this power to its argest extent. A supply of oxyen is required for the germination f a seed as well as for the growth f a plant. It is of consequence, herefore, to the grower that oxyen should gain access to every art of the soil, and thus to the eed and the roots of plants. This asy access is, of course, facilitated rtificially by the perfect working f the land and making it as porus as possible. But there are ome soils which absorb oxygen ith more rapidity and in larger uantity than others.

— Comparisons. —

Clays absorb more oxygen than andy soils, and vegetable soils nd peats more than clays. This is due in part to the natural porosity of the soil, and in part to its chemical composition. Clay, containing oxides of various minerals, for instance, absorbs oxygen which enters into combination with it, and decaying vegetable matter takes up much of it to assist in its decomposition. These remarks also apply to the power and natural tendency of soils to absorb carbonic acid from the atmosphere, together with the ammonia which rises from the earth from decaying matter, and nitric acid which may be formed in the air by electrical agency, and these contribute to some valuable extent to the natural fertility of the land, but necessarily in proportion to the power of absorption which is due to its condition of porosity, Nothing more positive than this, however, can be asserted, because of the absence of satisfactory experiments in this direction as to the relative capacities of soils to extract plant food from the atmosphere ; but one fact has been clearly ascertained—viz., that all soils absorb gaseous substances of every kind most readily and in the greatest abundance when they are in the moist state. The rain and the deposition of dew, as well as the condensation of moisture in the soil from the atmosphere which circulates within it, will all therefore favour this absorption of fertilising gaseous matter ; and this will be greatest in those soils which naturally possess this power in the greatest degree, and when the artificial condition of the soil, produced by thorough culture and pulverisation, assists its natural proclivities most effectively.

— Heat and Its Effects. —

The power of absorption of the sun's heat is an exceedingly important property of soils, and this varies with the character of the land. It has been found that the surface of the earth acquires a much higher temperature, when the rays of the sun beat down upon it, than the surrounding air. A temperature of 110 or 120 degrees is quite common, while at times it rises to 150, the temperature of the air being no higher than 70 or 80 degrees in the shade. Thus the soil is provided with a source of heat which is of the greatest importance to the growing crops. Every grower knows how his crop shoots up in growth on those warm, moist nights following hot days, when the accumulated heat of the soil is retained, and intensifies those chemical agencies which change the plant food of the soil into vegetable tissue, and thus force the surprising growth which is noticed under such favourable circumstances. The power of absorbing heat depends upon the colour as well as the texture of the soil.

— A Comparison. —

Everyone knows how the sun's heat is absorbed by dark-coloured clothes, and that it is for this reason that light-coloured clothing is worn in the summer ; also, how a black kettle will heat water over a fire more quickly than a bright one. In the same way, and for the same reason, a dark-coloured soil absorbs very much more heat than a light-coloured one, and hence the vegetation upon dark soils will be more luxuriant than upon light ones. The black peaty soils produce heavier and better crops than white or grey soils, and when light sandy soils are darkened by a liberal admixture of peat compost they are improved very considerably. The power of absorbing heat possessed by dark-coloured soils, however, is not accompanied by a corresponding tenacity for, or power of retaining, heat, for black peaty soils will cool as much in one hour after nightfall as a light sandy or clay soil will in three. This difference, however, does not operate wholly to the disadvantage of the dark soils, for as the cooling progresses most rapidly, the dew is deposited with equal facility, and it is probable that this accession of moisture is of greater benefit to a parched soil than the longer reretention of heat. Besides, as the dark soils become heated more abundantly than others, they can better spare their excess of heat than lighter soils can, and yet have an abundance remaining for every need of the crops.

— Man's Control. —

Such then are, in the main, the most important physical properties

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of the soil. Over many of them the intelligent grower has easy and effective control. He can drain land that is excessively wet, or which is sealed below by an impermeable subsoil, and thus open it to the influences of the atmosphere with all its burden of fertilising agencies, and to the influence of the sun's heat. He can plough and pulverise, and make it more open and porous, and so give effect to its chemical influences over such organic matter as it may contain, thus more quickly preparing it as food for crops. He can stiffen and darken the lighter sandy soils, and loosen and soften the heavier clay by mixing composts or manure with them, and thus make both more valuable for his purposes. But while the physical properties of the soil have much to do with its productive powers, they are only secondary and helpful to its primary condition of fertility. It may be neither too heavy nor too light, too high nor too low, may be situated in the most favoured climate, and consist of a well-proportioned mixture of sand and clay, contain an average quantity of vegetable matter, and have every benefit of a warm and favouring locality, and yet it may disappoint the expectations. The want of one of the indispensable elements of plant food in it may forbid the growth of one blade of grass and make of it a barren waste.

— Chemical Constitution. —

Therefore the physical properties of the soil are only accessory to its chemical constitution, and make available its natural fertility without adding to it. But the study of these physical properties of soils is not without an important practical value. A farm may comprise a fertile soil, and be endowed with an abundance of suitable food for crops. It may have every provision for their valuable use, and yet its condition may be such that only the lowest and most useless plants can support themselves upon it. It may produce reeds and rushes, sour, unwholesome sedges, useless mosses and ferns, and weeds which are totally valueless for the support of animals, and yet the skilful worker, knowing the principles which relate to the physical properties of soils, may take such apparently undesirable land, and, by a judicious course of improving, may make a garden of it, and obtain from it the hidden stores of wealth which lie within it.

(To be Continued).

Vegetable Garden.

October Notes.

The work for October in the kitchen garden will consist of keeping all growing crops going by watering when necessary and maintaining a loose open surface by the use of the hoe. All summer crops may now be sown in the open and all seedlings should be put out. Tomatoes, Cucumbers, Melons, Marrows, Sweet Corn, Cape Gooseberry, Egg Plant, Chillies, will all make good progress. Sweet Potatoes should be planted for trial or part of the ordinary routine. All require well enriched deeply worked soil. Any extra manure available can go to the cucumbers, which are very heavy feeders. Plant potatoes for home use where water is available.

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Tomatoes.

Early plants may now be in flower but this will only be in exceptional cases. If the ordinary suburban gardener has good sturdy plants nicely started after setting out, he will be doing well. There is little gained by very early sowing unless one is prepared to give a great deal of attention to the plants. Seedlings put out now will make good progress, whilst seeds sown in the open where the plants are to stand will make up a lot of ground on pot grown seedlings if the weather continues reasonably warm. There are so many good sorts which differ only in minor degree that it is quite impossible to name the best. It is always good policy to stick to at least one old friend and it is also interesting to try one or two new ones. In preparing a bed for tomato planting pay attention rather to deep digging than very heavy manuring. In fairly good garden soils which have recently had a dressing of stable manure good tomatoes may be grown with the addition of artificial manures at time of planting and as liquid manure when the plants are making growth. In such soils superphosphate at the rate of, say, 2ozs. to the square yard, will be found to answer quite well, but the ground must be deeply dug, i.e., two spits, and be well broken in the digging. A noted grower once said that if he only had three days to spend on tomato growing he would use 2½ of that time in digging the ground and in bringing it to a fine mechanical condition. This was, perhaps, an exaggeration, but it serves to emphasize the importance of preparation. The best and cleanest tomatoes as well as the earliest are grown on a single stem which is tied to a stake previously placed in position and this is continued till three fruit clusters are developed, the leader is then stopped and all side growths suppressed, till the first crop is ripening. Even if this single stem method is not adopted, tomato plants will do better if given some support in the way of a trellis than if allowed to sprawl over the ground, for in this case fully 50 per cent. of the fruit is likely to be more or less blemished. There is no better preventive of the diseases to which the tomato is subject than free circulation of air, and this is best secured by trellising. A frequent mistake made in tomato growing is the giving of too much water. Try to so adjust the supply that the plants make steady, healthy growth, but avoid rushing them. Big, strong, sappy tomato plants are a sign of the free use of the hose but not of good gardening.

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Tommy, at a concert, watching a soprano singing the aria and the conductor waving his baton:—"Ma, what's that long-haired man hitting at her with that stick for?" Mother.—"He is not hitting at her." Tommy.—"Then, what is she screaming about?"

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The Passion Vine.

Every house garden should have one or more passion vines, for they are quick growers, fruit early and are, as a rule, heavy croppers, besides being ornamental and useful as screens when trained over wire netting fences, on walls, or over arches, etc. The present is a good time to procure plants from the nursery. The vine is a rather hungry feeder and the place they are to occupy should be deeply dug and have some old manure mixed with the soil. For some reason the passion vine is not largely grown in this State and very considerable quantities are imported. New South Wales is at present the largest producer in the Commonwealth and very heavy profitable yields are frequently reported. Planting is going on rapidly in Victoria. The vines are somewhat impatient of frost and of hot winds, but should do anywhere the orange thrives. In New South Wales they are frequently planted as a temporary crop in citrus orchards, for they fruit from the second year from planting out and continue bearing for five or six years, when they usually die out or are in any case, removed to make room for the citrus. The New South Wales method of growing is somewhat different from that followed elsewhere, and consists of confining the plant to a single leader, which is loosely tied to light poles connected with a single, or sometimes double overhead wire which runs above the row at a height of five or six feet from ground level. Secondary leaders are then trained to right and left, each vine forming a T and the whole row presenting the appearance of a succession of arches. The alternate system is to train as a fan on a five-wired trellis. If planted as a full crop the distance apart at which the vines are planted varies considerably, but it is generally considered that 16ft. by 8ft. is too close, whilst 16ft. by 16ft. errs on the other side. With regard to pruning, which is seldom attempted in the home garden, Mr. Allen, the New South Wales fruit expert suggests that "about the first week in November, of each year will be found the best time for pruning this vine, which process consists in cutting back all growth to within about 1ft. from the wire on the underneath side, and if the vines are old and very thick along the wires it will be found advantageous to thin out at least half of the remaining portion. By pruning at this time of the year the early crop may not be very heavy, but the winter crop will make up for the shortage always, of course, provided the vines are suitably cultivated, manured, and are not growing in a locality where they are subjected to heavy frosts." Whatever method of growing may be adopted it is necessary, both with old and young vines, to defer any cutting away which may have to be done till danger of frost is over. Should a vine become frost bitten it should be cut back to healthy wood, otherwise the whole plant is liable to die. Passion fruit seed germinates readily and a few young seedlings can usually be found around an established plant. The passion vine can also be propagated by cuttings. Seeds may be sown this month in sandy loam by anyone interested in growing his own fruit right from the jump, but for the average gardener pot grown plants from the nursery, which may be procured very cheaply, are best. Though there is some variation in type no classification has as yet been made. Some while ago we noticed paragraphs respecting a large fruited variety said to have originated in W.A., but we have not heard of it recently. We have also seen a Mammoth variety advertised in New South Wales, possibly the W.A. introduction has been christened. Like many other foreigners, Mammoth in South Australia appears to be a somewhat ordinary production. The fruit of Tacsonia Mollissima is sometimes called the White Passion Fruit, but is no relation to the true Passiflora edulis. It is a handsome climber but the fruit which it only occasionally ripens in the open around Adelaide, leaves a good deal to be desired in flavour, though this is of course a matter of opinion.

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It will be noted by advertisement elsewhere that that well-known Colonial Company, the New Zealand Insurance Co., is now issuing live stock policies with most favorable conditions, specially prepared to meet local requirements, covering death from fire, natural causes and accidents. Foaling risks are made a specialty. The local agents throughout the state—their location being denoted by the well-known "Maori Head" agency plate, which is to be seen in all the chief centres—will be pleased to furnish rates and particulars, which can also be obtained at the head office for South Australia, 112 King William Street, Adelaide. Every description of insurance, excepting life, is covered by this progressive company, and already the large sum of £8,000,000 has been paid in claims.

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Practical Hints on the Destruction of Cut Worms in the Vineyard.

By F. de Castella, Government Viticulturist, Victorian Journal of Agriculture.

In these insects we have no new pest, but one which has long been with us. Vine-planters of 20 years ago knew them well, though, owing to the small amount of vine-planting carried out until quite recently, this fact has been forgotten, and cut worms are often spoken of as a recent introduction.

The prevalence of the trouble varies greatly. It is common to find, in the same district, one vineyard which suffers severely, whilst another perhaps only a mile away, is quite free. Sandy soils are usually more liable than stiffer ones. In many of the pine-ridge vineyards recently planted near the Murray, damage from cut worms has been severe. Nevertheless, trouble has also been experienced in some vineyards planted on stiffer soil, though, as a rule, to a lesser extent.

— Preventive Methods. —

A predisposing cause of trouble is the presence of an abundant crop of weeds at the time the moths lay their eggs. These appear to instinctively realize the presence of food for their offspring on dirty land, and to avoid laying their eggs on ground free from weeds.

The ground of the young vineyard should be clean and well cultivated from the commencement of winter. Attention to this point alone will greatly reduce the prevalence of the insects. Subsequent cultivation, no matter how thorough, will not give security once the eggs have been laid. In fact, it only aggravates the trouble. As the caterpillars cannot find any plants to feed on but the young vines, their concentrated efforts are all the more severely felt. In the keeping clean of the ground on which young vines are to be planted, or of young resistants which it is intended to field-graft in the following spring, we have a means of prevention, the value of which is not sufficiently realized.

Preventive treatment, by destruction of the moths before they lay their eggs is also worthy of consideration. Judgement and close observation are necessary in order to hit upon the most propitious time of operation, when the months are abundant and ready to lay their eggs. Acetylene lamps of special construction are used for this purpose. The burner is situated a few inches above a shallow tray, filled with water, on the surface of which is poured a small quantity of kerosene. The insects, attracted by the strong light, get their wings singed and fall into the tray, where they are found in large numbers in the morning.

Lamps of this description have been successfully used at the Wahgunyah Nursery during the past two seasons. It is not easy to estimate to what extent subsequent invasions were prevented by this means, but there is no doubt that large numbers of moths were destroyed. The lamps available were far from perfect, the automatic regulation of the gas supply being more particularly defective.

In France, trap lamps of this kind are largely used for the destruction of Cochylis and Pyrale months, the larvae of which, in the shape of minute green caterpillars, are responsible for an enormous amount of damage in some districts. In parts of Champagne, where such lamps have been used on a large scale, six lamps per acre are considered sufficient. The type of lamp most largely used was one fitted with Bray's patent "Ceto" burner, burning 10 litres (about ½ cubic ft.) per hour, and taking a charge of 7ozs. of carbide, sufficient to last five or six hours. The tray is 20 inches in diameter and 1¾ inches deep.

Though capable of giving good results in nurseries, trap lamps are not, owing to the large number required, and the difficulty of attending to the lamps at night, so practical in the vineyard.

— Arsenical Poisoning. —

This is the method of protection which has given the best results in Victoria. Two distinct systems have been largely used :—

1. Spraying with lead arsenate in suspension in water.

2. The use of baits, in close proximity to the young vines.

Each has its partisans, and each has given excellent results when properly applied. According to circumstances, one or other method may be more suitable for a given case. It will often be found advisable to combine both methods.

— Lead Arsenate Spray. —

The most suitable strength seems to be 3lbs. of any good brand of arsenate to 50 gallons of water. This strength does not in any way injure the foliage or tender roots, whilst it is sufficiently strong to destroy the caterpillars, especially when they are young. In fact, in order to obtain the best results from such sprays, they must be used when the larvae first hatch out from the eggs. It is easy to understand that, under these conditions, a very much smaller dose will prove fatal than later on, when the insects have attained a certain size. It must be remembered that they grow exceedingly rapidly, feeding the while on the unfortunate young vine. A careful watch must be kept, and on the very first appearance of the trouble, evidenced by characteristic small holes eaten out of the tender leaves, the whole of the young vines must be immediately sprayed.

At the Wahgunyah Nursery, last season, spraying completely prevented any damage, but it was applied from the very first appearance, when none of the cut worms were longer than ¼ inch. Three separate invasions had to be fought in this way, resulting from eggs laid by three different generations of moths. The first spraying was given about the second week in October, the second about a fortnight later, whilst a quite distinct generation of minute cut worms necessitated the commencement of a third spraying on 22nd November.

In spite of the very sandy nature of the soil, and the fact that the nursery was surrounded by paddocks where the grass was high, conditions favourable to the pest, these three sprayings absolutely protected the young vines from damage.

— Baits. —

In order that spraying may be successful, there must be some green foliage to spray ; in other words, the young vines must have sent out shoots and small leaves before the cut worms make their

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LADY IN ATTENDANCE.

appearance, as was the case in the example quoted above.

If, as not unfrequently happens, the cut worms are in the field first, that is, before the vines come into leaf, spraying is useless. This is what frequently happens when the land has, during the winter, been covered with weeds, which have been suppressed by repeated cultivation, just before the vines were planted (or grafted in the case of field grafting). In such circumstances, considerable numbers of quite large cut worms may be about before the buds of the young vines burst.

The deadly effect of these, on the young plantation, can easily be imagined. The young buds may be eaten right out, before they break through the protecting mound of soft soil; other shoots growing from latent buds meet with a similar fate, and the young vine is often killed outright, or, at any rate, so considerably damaged and its start into growth so much retarded as to permanently injure it. As many as 16 or 20 fair-sized larvae have been found in the soil at the base of a single vine. Field grafts, in spite of the rapid growth they make, are often seriously damaged, if not completely destroyed, in this way.

Against such visitations the only practical means of defence is the use of baits. A formula which has given good results is the following:—Bran 10 lbs., molasses 4lbs., Paris green 4ozs. The whole to be made into a paste or dough and placed, in small pieces about the size of a nut, in close proximity to the young vine. These are greedily eaten by the cut worms, which are thus destroyed in large numbers.

The baits are no longer acceptable once they are dry. As the weather is hot in October and November, they dry up very rapidly, and cease to be of use after the first night. Baits should, therefore, only be put out after sunset. Should all the insects not be destroyed by the first application, it is necessary to repeat the dose. It is well to remove the dried-up baits previously put out, on account of the injurious effect of the arsenic on vegetation if left to be washed into the soil by rain. For this reason, care should be taken not to place the baits in contact with the young vine, but at least an inch or so away from it.

In one plantation where this precaution was not observed, many vines subsequently died from arsenical poisoning. The cause of death was at first obscure. The action of the arsenic contained in baits, which had been extensively used (with very satisfactory results so far as cut worm destruction was concerned), was suspected. Analysis revealed the presence of arsenic in the interior of the stem of the dead vines, so there appears to be little doubt as to arsenical poisoning being the cause of death.

Paris green, which usually contains more or less free arsenious acid, could probably, on this account, be advantageously replaced by arsenate of lead in the bait formula given above. The insolubility of the latter salt would insure safety from a similar mishap. Nevertheless, with due care against absolute contact, there is little or no danger. Although Paris green baits were very extensively used in Rutherglen during the past three seasons, in only one case was poisoning reported.

— Vegetable Baits. —

It is probable that good results could be obtained by growing, in close proximity to the young vine, plants which the insects eat readily, and which could, by spraying with lead arsenate, be converted into poisonous baits. These would be capable of acting so long as the arsenate remained on them, instead of merely for a single night, as is the case with the artificial baits. Arsenical poisoning of the vine would also be obviated.

Young Soya Bean plants are greedily eaten by cut worms, and it is possible that they would prove very suitable for the purpose. A couple sown on either side of, and quite close to the young vine, when this is being planted, would give something to spray with lead arsenate before the vine buds burst into growth.

The suggestion is made in the hope that it may prove of service during the coming planting season. Of course, other plants might prove more suitable than the soya bean; it is one, however, which seems to be very acceptable to the insects.

— Other Methods. —

There are, no doubt, other ways of combating these troublesome insects, but, so far as Victorian experience is concerned, arsenical poisoning has give the best results. Hand-picking round the young vine, though effectual, is too laborious, and consequently costly, as well as very slow. In France, hand-picking by the light of a lantern at night, when the insects are above ground, is often recommended.

The use of strongly smelling substances in the soil, around the vine, in order to render it an unsuitable refuge for the insects during the day time, has been recommended. Naphthaline and several proprietary mixtures, such a "Vaporite" and others, seem to be suitable for the purpose, as well as watering with solutions of Benzole emulsion, Sulphide of Potassium, etc. Some of these have been tried, and good results are claimed for them, but further experiments are necessary before they can be confidently recommended.

In the case of severe outbreaks, a combination of the various methods mentioned above is advisable.

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Fruit Notes

Only the best should be the aim of the home fruit grower, equally with the commercial man. A big step in this direction is to have the trees free from insect pests or disease. Considering that the amateur can buy a serviceable bucket spray pump for less than 30/—we have seen one line quoted at about 20/—and that many preparations are put up in concentrated form which only require liquifying, and are procurable in quantities at 1/- and upwards, there is not the excuse for the wormy apple, scabby apricot, etc., that there was when spray pumps were an expensive luxury and the making of the various spray preparations a matter of some difficulty and unpleasantness. Armed with one of these pumps and a jar or two of Arsenate of Lead, Bordeaux Mixture, and Resin Wash, the amateur gardener can bid defiance to most of his troubles, whether they are of fungus origin or belong to either the chewing or sucking brigade of the insect host.

Sooty mould of the orange, lemon, etc., which shows itself in dark coloured flaky encrustions on the foliage, also on fruit and wood, is more unsightly than destructive, but it is always associated with one of the scale insects and the remedy is to clear the trees of the latter. Resin wash or kerosene emulsion will do this to a large extent, but fumigation, which is best done in summer, is the only certain cure.

Where shot-hole and scab of apricot and other stone fruit is usually prevalent a second spraying with Bordeaux soon after the fruit has set will be an extra safeguard against the spoiling of the fruit. As the season promises to be dry there will probably be less need than usual for doing so, but with apricots especially, it is not likely to be wasted effort.

Another pest will shortly be adding to the troubles of the amateur fruit grower, viz., the Curculio Beetle. It is not a beetle, really, but one of the weevil family. As it is a night feeding insect the gardener may be excused if he fails to trace the culprit responsible for the disfigurement and disappearance of the foliage on his fruit trees. Orange, almond, and apricot, seem to be the principal sufferers, but practically all fruit trees are liable to attack, also roses and other garden plants. The curculio likes young succulent growth and after dark ascends the tree and gets out to the tender shoots. He then proceeds to chew around the leaves. If left alone and the season is a bad one, the curculio is capable of doing an immense amount of damage. When caught he will be found to be a small dark brown, or black beast about a quarter of an inch long and half as wide. The way to catch him or rather one of the ways, is to wait till well after dark, then quickly and without a light, spread two small sheets on the ground under the tree, then shake the tree and the beetles will drop on to the sheets and may be transferred from there to a bucket of water with a little kerosene on top. Where many trees have to be done, it is worth while knocking up a few light lath frames sufficiently large so that two of them will cover the whole of the ground over which the tree extends and tack calico or some similar material over them. It will probably be necessary to go over the trees several times at intervals in order to make a complete clearance. Another method and a good one, where fowls are kept, is to run a few broods of chickens amongst the trees. If a mother hen is tethered to a tree and the chicks run loose you can reckon that tree as safe. A sheepskin band tied around the stem is also a good trap. Where large numbers of trees have to be protected some form of arsenical poisoning, either dry or as a spray, is the only practical method of extermination.

Oidium, or mildew, is the cause of much loss of fruit in the home garden. If can be controlled by the fumes of sulphur. Apply the remedy by dusting the vines with very finely ground sulphur. The finer it is the better the work. It is only effective during hot weather. Apply when the shoots are 6 to 8 inches long, also when the blossoms open. The first symptom of the disease will be small patches of whitish appearance on the young leaves. If neglected it will spread to the shoots and afterwards to the fruit.

Pick off and burn peach leaves showing curl. Judging by the weather it is probable that this disease will be less in evidence than usual of late years. It is questionable, if late spraying is of any use whatever in combating this disease.

Oranges and lemons can be budded. Ripe buds only should be used and they should be taken only from healthy prolific trees. Fruitgrowers, professional as well as amateur, are apt to overlook the fact that there is a certain amount of individuality in trees, not so pronounced, perhaps, as in animal life, but still it exists, and it is just as wise to perpetuate a good individual tree as it is to multiply trees of a good variety. Any chance bud may, no doubt, yield as good results as a selected one, but there is a rapidly growing belief that the chances are greatly against its doing so.

Young shoots from grafts should be tied to some support so as to prevent the possibility of their being rubbed or blown off. When tying, do so so that the growth is directed as required, loosen or remove graft bandages when union has taken place.

When a young tree is planted it has the possibility of making a certain amount of growth. If left to itself the bulk of the growth made the first year may occasionally be almost valueless to the grower and will have to be nearly all cut away the following winter if a decent shaped tree is wanted. Even under favourable conditions of natural growth a good deal of the wood is wasted. This can be very much reduced if the grower will take the trouble to take a hand in the game by training the growing plant. It may not be practicable for the big orchardist to "nurse" his trees for the first two or three years, but the home gardener will find the occupation interesting and he will be surprised to find how plastic and responsive his trees are. The main object to keep in mind is to concentrate all growth into the most useful channels, by rubbing out young shoots which are not wanted in the make-up of the future framework and also by checking any part which is running away. To do this just nip out the soft growing point of this strong growth and so give other parts of the tree time to catch up. Half an inch nipped out at the right time may do more "stopping" and much more useful work than half a yard at the wrong.

Olive truncheons may be planted. Pieces of ripe wood 1 to 2 ft. long and 1 inch thick laid in the ground are best. Olives may also be grafted.

Oranges, lemons, and other citrus trees may be planted. In doing so it is wise to remember that preparation of the ground as may be necessary will often mean a couple of years' gain in the first ten years of the tree's life. One can see any number of instances in and around Adelaide and equally, of course, wherever oranges are growing, of the important part which the man behind the tree plays in fruit production. Side by side almost there are healthy vigorous trees and sickly, half dead specimens, the conditions are quite similar, but the man is different. How to prepare the ground will, to some extent, depend on the soil and subsoil. If you are blessed with a nice free, well drained, sandy loam of good depth, all that need be done is to double dig a space about four feet square and set the tree in the middle, a few handfuls of bone dust dug into the bottom spit will do no harm. If you are on shallow limestone take out a big hole, the bigger the better, throw aside the stone and rubble, then make up the deficiency with the best material you can find, roadside skimmings, old decayed garden refuse, some very old manure. Mix this thoroughly with the soil and plant as before. If your ground is underlain by a stiff clay, it will be better to rely on the surface soil. In any case do not dig into the clay, especially if it is that soapy blue stuff for any hole you may dig in it, will simply be a trap which will hold water like a barrel and eventually kill the tree. When the trees come from the nursery the roots will be balled and bagged. There are many different opinions as to what course to pursue. Some people say dig a hole and put in the tree, bag and all. This reduces root disturbance and the bag will rot. Others say, open the bag, break the ball slightly and spread out the roots, and finally it is sometimes advised to wash all the soil away and plant as if it were a deciduous tree. They may all be right but a good deal depends on the original packing of the roots and the kind of soil balled with them. If it is a free, clean, loam, and the roots were cleanly cut, not torn, when lfting from the nursery, the first method is as good as any, at least we have seen some very flourishing trees which were planted bag and all. It often happens, however, that if the soil of the nursery bed is very loose, a very much stiffer soil is pudded round the ball, if this should be so, then it is certainly wise to break this coating away. We recently suggested to a friend that a tree which had stagnated in his garden for a couple of years, should be lifted and replanted. This was done and it was found that the original ball was still intact and as hard as a bullet. A few roots had grown over but none through the ball. The tree is now showing marked appreciation of the change. The pruning of newly planted citrus is also a disputed point. If the head is very bunchy we should take out the centre, if it was a tall whipstick we should shorten it considerably, but if the stem carried two or three nicely-spaced growths we should leave it alone beyond a little stopping. Probably there would be little difference between three trees so treated in two or three years' time. In planting, try to set the tree so that the upper roots, as they spring from the stock, will just show at ground level.

If suitable scions, i.e., dormant ones, are available, crown bark grafting of "stumps" may still be done.

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Ensilage for Dairy Cattle.

From the Journal of the Victorian Department of Agriculture.

Every form of life that we have any knowledge of is built up of countless small living masses of micro-organic or proto plasmic formations which are called cells. A growing plant is no exception to this rule, and throughout its whole structure there is a continuous circulation of air, and a fluid which we know as sap, and which performs some of the functions of blood in the animal. This sap conveys to the growing plant the food which is drawn from the soil by its roots; and from which is built up, first the framework of the plant itself, and finally the flower and seed formation by means of which the plant or some variety of it will ultimately be reproduced. When a plant is either cut down, or approaches maturity, the circulation of fluid throughout its system ceases; the leaves and stalks wither through evaporation of moisture; the cells within it die; and, in the absence of the sap, the fibrous material of both leaf and stalk becomes drier, harder, and less easy of digestion by animals.

— Green Food. —

No fodder is relished so much by stock as the fresh spring pasture that is forced into rapid growth by the seasonable combination of warmth and moisture in the soil. Its appearance is synchronous with the natural breeding season of herbivorous stock, when the young animals require the heaviest milk flow. The mature stock then also again begin to make flesh, and to store fat in their bodies as a reserve against the more scanty food periods of late autumn and winter. No amount of dry fodder can take the place of this green food. It has a wonderfully recuperative action on animals that have become low in condition; and its invigorating effect is upheld by the still more strengthening and sustaining properties of the herbage as it matures and ripens its seed. The animal is thus better prepared to withstand the strain of any shortage of food to which it may later on be subjected by seasonal conditions. Green food, therefore, is the natural precedent, as well as the accompaniment, of robust health and a good milk flow in the dairy cow; and the farmer who does not take provision to keep his cattle supplied with green food throughout the whole of the year is not doing justice to his herd or consequently to himself. In localities which are favoured with early autumn rains, or where irrigation by any means is possible, this annual dearth of green feed does not so generally occur; but over the larger part of Victoria a full supply of succulent fodder during the late summer, autumn, and winter months is only possible where fodder crops of grass, cut green, have been preserved in the form of ensilage.

— Ensilage and Its History. —

Ensilage is a term used to designate green fodder that has been preserved in bulk in such a condition that its original succulent condition and feeding properties are retained. When, therefore, ensilage is fed to stock, approximately the same results are obtainable from it as from the same weight of the fodder when it is freshly cut or of grass when it is grazed.

This method of preserving green fodder has been known and practised for very many years past; and, while it has not yet received the widespread attention from stock owners in Australia that its value warrants, yet probably in every district of the State there are some who have proved by practical test the inestimable value of ensiled fodder for all stock. The scientific investigation of the process of ensilage making dates back to 1875 when Goffart published the results of some successful experiments with silage carried out by himself in France; and since then the use of the silo in its various forms has become gradually more common throughout Europe, America, and Australia.

— Areas and Quantities. —

This State is fortunate in being practically sure of a good growing season each spring; and it therefore rests with every dairy farmer to cultivate enough land each season that will enable him to harvest whatever quantity of fodder will be sufficient to keep his stock up to their full measure of productiveness throughout the whole of the ensuing year. It is estimated that a cow will annually consume from 12 to 18 tons of green fodder if it is obtainable; but, as in normal years fully half of this feed can be gathered by the cow on any fair pasture land, the providing of about eight tons yearly of ensilage for each cow should suffice for all requirements. It is only a very medium crop of maize that does not yield more than this weight of fodder per acre if properly cultivated; and in favourable situations and seasons from two or three times this amount is frequently harvested. As a general and safe estimate, therefore, it may be taken that the systematic cultivation of an acre of ground for green fodder for each cow kept, and the storage of the crop as ensilage, will enable every dairy-farmer to keep up a regular milk supply from his cows from year to year.

— Plants Available. —

Almost every plant that is useful as fodder in its green state can be preserved as ensilage; and even the coarser grasses, and thistles, that are inferior in quality, or not easily gathered by stock, and are thus seldom eaten by them except under forced conditions, will make into fairly profitable ensilage when sufficiently abundant to be easily

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harvested. It cannot be claimed that ensiling improves the nutritive composition of any fodder. All that can be looked for under the most favourable conditions is that the material will come out of the silo as good in the way of nutritive properties and palatability as it went in. What does occur in silage making, however, is that during the process of fermentation the hard and fibrous structures of the plants become softer and more easy for digestion; and therefore, whatever feeding value is contained in a coarse fodder is made more easily digestible when it has been ensiled. In the latter case also the plants would be harvested when in the fittest stage for digestion; whereas more often they are past that stage before stock have occasion or will endeavour to use them in their natural state. In putting down as silage any extra soft or immature fodder, it is as well to allow it to wilt to a partially dry stage before chaffing it; or else it should be evenly mixed in with some less juicy material; otherwise there will be an excessive flow of sap from the silo as the fodder settles.

— Principles of Ensiling. —

Ensilage is made by the exclusion of air from a bulk quantity of green fodder by close packing; and its quality is mainly dependent on the completeness with which the bulking process is effected. Green fodder when cut and exposed to air either dries up or rots, according to whether the air has free or only partial access to it. As already stated, most grasses or fodder plants in an advanced stage of growth can be made into ensilage; and the best feeding results are obtained when the material preserved is cut in the state just prior to its ripening. There is then sufficient of the plant juices still present in the stalk to uphold its value as a succulent green fodder; and, with the flower and seed formation well advanced, the plant will then have within itself all the constituents that make it most valuable as food for stock.

— Oats and Maize. —

Oats and maize are the principal crops that are cut for silage in Victoria; the former in the north, the latter in the southern districts. As a general farm practice harvesting an oat crop to the silo can hardly be considered the most remunerative method of obtaining a return from the ground cultivated. An oat crop can be harvested as either hay or grain; and, as such, if the quality is right, can always be profitably disposed of if not required. A maize crop on the other hand can be most profitably dealt with on a dairy farm either as green fodder or ensilage; for when harvested for the grain, the dried stalk is past its best as stock food. Maize is also the crop from which the greatest bulk of green fodder per acre can be harvested in Victoria; and therein its value lies. The method of storing it so that it can continue to serve the purpose of a green fodder is the best for the dairy farmer. It grows, and is harvested, when most other crops are past maturity, and when the pasture grass is drying up; therefore it is as green fodder, available during the summer season when the natural pasturage is scanty and past its best, that maize is so valuable on the dairy farm.

— Oat Ensilage Unprofitable. —

Many dairymen make some portion of their oat crop into ensilage in order to guard against a shortage of green fodder occurring before their maize crop is matured. No doubt in some years this is absolutely necessary; but it need not be so if more maize had been grown the previous year, and more silo accommodation provided for it. A fair maize crop will return three times the weight of fodder per acre that can be gathered from a green oat crop; and when both are in a similar state of maturity there is little apparent difference in their feeding value. As a general thing, therefore, the crop planted for ensilage making should be maize; and enough ground should be reserved from which to harvest the full silo accommodation each year; and the silo accommodation should be sufficient to hold a full year's supply of not less than five tons per cow. If it pays to make provision for five months' ensilage supply for the heaviest yielding crop, it must be equally profitable to make full provision in the same way for all that is required; and only sufficient oats need be grown to feed the horses and act as a stand-by for young stock should the pasture fail. Only in the absence of sufficient silo accommodation, therefore, will it be found most profitable to make oaten ensilage; or when an exceptional shortage of the previous maize crop renders it an absolute necessity. The abundance of wild oats in the wheat growing districts and the assistance the silo affords towards keeping the cereal crops clean, as well as the difficulty in some seasons of growing amber cane or other summer crop without irrigation, explain why the cereals are so frequently made into silage in the north.

— Packing. —

As the exclusion of air in ensilage is obtained by the close packing of the material, the chaffing of the crop before filling it into the silo is an advantageous procedure. By giving extra care to the filling and tramping down of the material good ensilage can be made from unchaffed fodder; but, as the particles of fodder in settling become more or less glued together, unless it is put in in fairly short lengths, it is not handy material to either get from the silo or use in stall feeding afterwards. Thus, while with long-stalked fodder, cutting out with a hay knife is necessary, the chaffed material can be easily raked or forked off the top; and as such is not only an easy fodder to handle but it is in handy condition for mixing with chaff, bran, crushed oats, pea-meal, or in fact almost any other fodder as desired.

— Tramping. —

The tramping or otherwise evenly and solidly pressing down the chaffed fodder over the whole surface while the pit is being filled has been repeatedly mentioned as the secret of successful ensilage making. The first result of close packing or heaping together of green fodder is the generation of heat within the material, which is caused by the chemical activity of the still living microscopic cells in the plants. As this action diminishes, if the material has been properly packed, the heat subsides; and the fodder is consolidated mainly by its own weight, and is preserved indefinitely. If from any cause air is allowed to remain within, or afterwards gain access to any portion of the silage, the process of heating through oxidization continues.

(To be Continued.)

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Salt for Cows.

In a recent Wisconsin Experiment Station report, Dr. S. M. Babcock gives an exhaustive review of the numerous experiments conducted to determine this question, and also submits data secured in three trials, two of which were carried on for a year. The earlier experiments were conducted for only short periods, and we are not surprised to learn that they were misleading, and, in fact, of no value whatever. The salient points of the summary are the following:—"In every case the cows exhibited an abnormal appetite for salt after having been deprived of it for two or three weeks; but in no case did the health of the animal, as shown by the general appearance, the live weight, or the yield of milk, appear to be affected until a much longer time had elapsed. This period of immunity varied with individual cows from less than one month to more than a year. In every case there was finally reached a condition of low vitality in which a sudden and complete breakdown occurred, from which recovery was rapid if salt was supplied quite promptly. This stage was marked by loss of appetite, a generally haggard appearance, lustreless eyes, a rough coat, and a very rapid decline in both live weight and yield of milk. The breakdown was most likely to occur at calving, or immediately after, when the system was weakened, and the flow of milk large. In general, the cows giving the largest amount of milk were the first to show signs of distress. They all suffered less on pasture than when confined to the stable. The success in these experiments must be chiefly attributed to the exceptionally long periods during which salt was withheld. In no previous tests, so far as the writer knows, have cows been deprived of salt for more than thirty consecutive days, which period is shown to be entirely inadequate, under conditions which exist at this station. The 23 cows that were deprived of salt in our trials all continued for more than sixty days, and several of them for more than six months, before any noticeable effect upon their physical condition or yield of milk occurred."

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Home-Made Cheese.

Though the majority of country people relish a piece of good cheese comparatively few farmers make any of this palatable food. Since the advent of the cream separator there has been less made than previously. In old times, when the milk had to be set in dishes, and the cream skimmed, farmers' wives frequently made sufficient cheese for home use. Amost every housewife knew how to make it. L. M. Dean, writing to Orange Judd Farmer on the secret of making good cottage cheese, states:—"For years I have made it for market, and now I can sell more than I make. Cottage cheese, to be first-class, should be handled much like the domestic cheese. As soon as it is soured enough to be thick, set on the back of the range with a standard of some kind under it that the receptacle may not rest on the hot stove. When the whey begins to come to the top stir from the bottom, and then allow it to again settle, stirring every few minutes until the temperature is about 100 degrees. Set off of the stove, and as soon as the whey rises again pour off carefully. Now, over another dish spread a square of cheese cloth which has been wrung out of cold water and pour curd into it. If you are not in a hurry gather the edges together and hang up to drain; if you are, set in a colander and press carefully until quite dry. Empty into a dish, salt to taste, and then add thick, sour cream until quite moist. Make into small round pats just as quickly as you can, but handle only enough to get them in shape. Set in a cold place until ready to serve. Following those directions you will have a cheese, rich, soft, moist, and delicious to the taste.

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Kicking Cows.

There are cows less amiable than others. Some are so docile that hardly anything will induce them to lift a foot in resentment, defence, or for mischief, whilst others are ready to let fly on the slightest provocation. None of them kick excepting when being milked or handled in some other way, but many a milk pail is overturned, and the milker sent spinning, too, when the milk is being extracted. Indeed, this (says a writer in The Farmer and Stockbreeder) is the time when the trick is acquired, and it may either be very temporary or permanent, according to the management of the milker. Many young heifers being milked for the first time are disposed to kick. This is done in fear or ignorance. Others, of all ages, are inclined to kick by having sore teats, and in these cases there is some excuse for the cow kicking. In dealing with heifers it is well to handle them a good deal before calving. When their udders are filling up and distending, they enjoy a gentle hand being put on them and rubbing. This is a fine stepping-stone to a quiet milker, and should be practised, but if they are a bit wild that disposition must not be increased by abusing them. This is the worst possible treatment, and will increase the habit. If a cow gives one a smack, there is no earthly good in hitting back. Many hotheads do this, and not only get the worst of it, but spoil the cow. A row of this sort makes the cow nervous, and when in that state she does not yield her milk readily, and much of it is kept back. Some strap the two hind legs together, others tie up one of the fore ones, and it all means bustle and superfluous operations. Ninety-nine in every hundred may be induced to give up all inclination to kick in a very short time—indeed, in a day or two. This is not by thrashing, or trying to get her subdued by force. That is a fruitless game, but a gentle hand and a coaxing will tame the worst. This is undoubted. I have seen ill-natured men and boys, and an occasional woman, too, that could not attempt to milk certain cows without being kicked at, while another man, boy, or woman would sit down by them, catch the teats, and go on milking without a foot being lifted. This is not uncommon, and the secret of it all is gentleness. It is quite surprising how quickly and correctly a cow will detect the milker's disposition.

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The Mule.

The following humourously appreciative article of a much abused animal is from Elder's Review :—

The merits of the mule, especially of that superb type of animal raised in this State, cannot help but appeal in a very generous spirit to all whose travels may have extended up North to that main road which runs up the Flinders Ranges towards the Blinman Mine. To speak kindly of the mule in the abstract to those that know him not is too often to find one's remarks greeted with a degree of derision which is hardly removed from rudeness. To make similar reference to an audience that can number men who have graduated on Beltana or Mount Lyndhurst, and have taken an active part in a sheep muster on these runs, is to be met with an appreciative echo. To dilate upon the subject in the presence of men who have punched a team up and down the Flinders Ranges, or of men who have travelled in the mail coach to and from Port Augusta and Yardea, is to provoke a degree of eloquence hitherto unsuspected. To the ordinary public, however, the subject seems to be one upon which its minds is hopelessly made up. Born under a cloud—for alas ! he is illegitimate, a fact of which he seems ever profoundly aware—it is under a cloud that the mule is doomed to live. He is credited with two positive virtues, surefootedness and a strong back, neither of which he can help ; for the rest, general opinion is sufficiently indicated by the fact that the word "mulish" has been introduced into the language as an expression for pigheaded cussedness in its adjectival form. It ill benefits the public to blame the mule, for the beast is not natural, but artificial. The Zoo knows him not, neither, presumably, did the Ark. He was not included in the scheme of nature, but is the invention of man. Actually, he is man's contribution to the animal kingdom, and it would be only decent, in weighing his characteristics, to remember our own responsibility in the matter. But no. Man gets his slave, and then gives it a sore back, a bad shoulder, and a worse reputation. The horse is noble ; there is pathos in the ass ; let us beat the mule.

The two cardinal vices with which the mule is popularly credited are the vice of stubborness and the vice of kicking. One readily grants that if a mule is obstinate the General Post Office building is not more immovable ; also that if a mule kicks he combines in the act the force of a piston with the accuracy and whole-hearted enthusiasm of a dancer in tights. Usually both these vices are combined in the same animal. Kicking in the mule takes two forms—one for general purposes and one for assault. In the first his heels tend to describe an arc of a circle about his fore-feet as pivot. In the latter he thrusts out one leg after the manner of the cow. The horse will give warning when he meditates guile—his aspect is that of a sinner—but the first notice you get of a mule's kick is the impact of his foot. He does not lay his ears back ; he is extremely accurate in his aim, and in range his leg is almost telescopic.

The ability of the mule as a worker is widely recognized ; his back is strong and his feet are sure, and he is probably at his best underneath a weighty pack. In a buggy he is seen to advantage, after he has been securely attached thereto, but the process of attachment is frequently exciting—he will do everything except approach the vehicle. One capital method of overcoming his superlative cunning, or feigned modesty, is to range the vehicle with the end of the pole attached to a stout railing fence—escape forward and sideways is thus frustrated. By fastening the head of himself and his mate to the fence conveniently near the polestraps the rest of him can be looped into position from the rear. When once secured into his place, he acts like the wise animal that he is, acknowledges defeat, and leaves the mark without further fuss. In a team with mates in front of him and mates behind him, he seldom evinces a wish to conjugate the verb "to jib" : should he do so, the attitude which he will most readily assume is a recumbent one. The mail driver on one of the northern coach roads (to specify the route would be unkind) who does a series of 30-mile stages with mules, gets over the first ten miles with an ordinary whip, the second ten miles with a long, pliant stick, and final ten miles with a waddy.

The finer qualities of the working mule are not those of accidental mechanics ; they are of the head and the heart. A more willing beast never existed ; and if he has equals, he has few, if any, superiors in the matter of endurance and of good-humoured philosophy. It must not, however, be supposed that the mule is devoid of animal weaknesses—far from it. He is extremely susceptible to cold and want of work, and, like his half-brother, the horse, he will, under those bracing influences, betray a spirit of irresponsible larkiness that is deplorable. In such a mood he loves to wait till the load is on his back, and then, before it can be strapped on, with one hilarious bound to scatter the pack in as many pieces as possible. The mule lives and works up to a ripe old age, and is provided with an unfailing remedy for fatigue—rolling. If he be exhausted, strip him of his load, free him from his chains or traces, and leave him alone. He will roll. Not only is a roll a magic recuperator for his flagging energies, but by a wise decree of Providence it is a practice of which he is passionately fond. The performance is ever worth watching. The deliberation with which he begins, the relish with which he employs each side in turn, and then lies deeply thinking, spread out perfectly flat, and plainly concentrating his mind on the last great effort, are ever

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orthy of observation. Then the
nthusiasm with which he tries to
ll clean over, and the air of
tisfied triumph with which he
ts up, having done so, are only
few degrees less exhilarating to
e weary man that is looking on.

The mule has undoubtedly a
nse of humour, though of a crude
pe. Possibly his reason for de-
anding his leading neighbour's
il or hair is that the naked re-
lt appeals to his idea of the
diculous. Of one form of jest he
ver tires—during the process of
ving his girths tightened he will
hale deeply, with the result that
hen he resumes his natural di-
ensions the work has to be done
over again. From this the ab-
rd creature invariably derives
exquisite relish. Though pos-
ssed of the horse's coat, he can
with less, and even with an
ology for, grooming. In the mat-
r of food he is by no means
inty, but somewhat difficult to
ease with regard to water. His
ot, though often badly shaped,
extremely hard, and need never
insulted with a shoe. In his
ice, and the use of it, the mule
tains his individuality. Unlike
e horse, he does not greet his
ates from afar, nor is he given
the derisive paroxysms of me-
dy with which the ass is wont
regale his lighter moments. In-
ed, he is a silent sort of beast;
only sings by way of thanks-
ving, his song being limited to a
ace before meat, a long-drawn
elancholy wail, as depressing as
e sound of an ill-played funeral
arch.

Though standing midway be-
een the horse and the ass, the
le inherits no trace from either
both of his parents; he blos-
ms out as a thing by himself.
the first mule was, so will the
t mule be—a creature of indi-
lual characteristics. He is a
eature without continuity, excel-
ce ready-made, but sterile, an
oluble mystery. Perhaps the
st inscrutable thing about a
le is this—he loathes a donkey!
a donkey he will commit the
st unprovoked assault, he bit-
ly resents any reminder of that
thstain. His coat is not the
nkey's, any more than his tail
the donkey's. His song, though
t the music of his dam, is far
noved from that of his detested
e. But there is no explaining
ay those ears, and the only way
establish friendly relationship
th the animal is to ignore, or
least pretend not to notice
em. You will never make a
end of him, much less retain the
ndship, if you insult the mule
his weakest points.

Training the Farm Dog.

Farm dogs are a nuisance rather than a benefit to their owners. In too many cases this is more the fault of their master than of the dog. One cannot expect any common bred cur to become a good shepherd dog. One must start right with a pure bred pup of that breed that has been bred for generations for this purpose. Such a pup when properly trained will pay handsomely for the time spent on him.

A large amount of patience and considerable time is required to properly train a dog. He should not be taught too much at once. Training once begun should be kept up until it has been learned thoroughly. One of the first things to teach a dog is to come promptly when called. While teaching him this he should know that he is to obey. If he is favored with a kindly pat or a bit of meat, he will understand more readily.

A dog that will drive cattle by running to their heads is of little use. He must be taught to drive stock at the heel. When teaching him to drive stock keep him at your side while you do the driving. He will thus get accustomed to driving at the heel. Make sure that this habit is well formed before you undertake to teach the dog to turn the stock to the right or left. With an over anxious dog it is well to use a rope on him as a restraint. In this way he can be kept from hurrying the stock too fast. Teach the dog to drive slowly and when older he will get the cows from the field without hurrying or exciting them. One should always be careful not to allow a vicious animal to turn upon the dog while in training. Such will most surely teach him to run to the head when driving. A little time spent upon a good pup while he is young will be richly rewarded later when you have a dog that is a source of profit and pleasure instead of a nuisance.

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Support the Foetus.

— Hoard's Dairyman. —

It is not all of dairying to get a big return from the pail. There is a calf to be raised as well. Not long since we heard at a dairy convention a man boasting that he fed no grain to his cows. All they got was ensilage and timothy hay. He said he wouldn't feed grain if he had it; he could make milk much more cheaply his way. Not long after we heard him inquiring very anxiously about some remedy to prevent calves from dying off. He said his calves came weak and did not live long. At first he thought it was due to the sire, but a change of sire did not help it any. We then told him of our experience in feeding brood sows on alfalfa during the time of gestation. He was quite interested, and inquired what effect the alfalfa had. We explained that the sow was called on to construct a number of little bodies. In their structure they are almost entirely made up of protein.

The mother cannot make strong bodies, made up as they are of protein, unless she is given an abundance of protein to do it with. It is the same with the cow. If she could have all the fresh grass she needed, that would be protein enough. But the man who does not give her protein enough to make what casein she must put in her milk, and also to build up the body of her unborn calf, does not see this question of nutrition in its right light. He said he would think it over. We suggested that he might find it to his interest to read some paper that treated on those subjects. He replied that he didn't need any such papers. He evidently thought it was cheaper to let the calves die.

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What the Head of the Dairy Sire Reveals.

In studying dairy sires we should be constantly on the lookout for indications which will reveal desirable characteristics. In the head are centered all the nerves of the body, and now the question is: Is there anything about the external construction to reveal the quality and the strength of the nervous system? The eye, which is closely associated with the brain, reflects, to a large extent, the nervous energy of the animal. We like to see an eye full and bright, active, but not of a nervous expression; a mild eye rather than one having a wild appearance. An eye of this kind reveals the right sort of nerve energy which should be possessed by the dairy sire.

The sunken and the half-closed eye indicates a nervous system which is unresponsive and lacking in quality. We should not select a dairy sire which reflected through his eye this sort of a nervous temperament. Nervous temperament does not mean an animal that is nervous, but rather nerve-full. A nervous animal is one that is lacking in nerve quality.

The distance between the eyes should be wide—that is, the animal should have a wide forehead. This denotes intelligence, and in turn a strong nerve centre. It is also desirable to have good length from the base of the horn to the eye. The combination of these different things indicates whether the sire has the right kind of a nervous system or not.

The large and open nostril is indicative of large and well-developed lungs. It shows that the openings to the lungs are large enough to permit an abundance of air to pass to the lungs to purify the blood.

The wide muzzle and mouth are also desirable. Since the mouth is the cavity through which the food must pass to the stomach its size is more or less indicative of the capacity of digestive organs. A large and powerful digestive tract is a prime qualification in all good dairy animals.

In general the head should be fine rather than coarse, but revealing strength. An animal, as a rule, with a coarse and heavy head, has a body that is also coarse and not possessing good dairy conformation. The coarse and heavy horn is also indicative of the same characteristics.—Hoard's Dairyman.

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Age of Greatest Profit.

A Bulletin from the Wisconsin Station (United States) states a cow is at her best during her fifth and six years, up to which time the production of milk and butter-fat by cows in normal condition increases each year. The length of time a cow will maintain her maximum production depends on her constitutional strength, and the care with which she is fed and managed. A good dairy cow should not show any marked falling-off until after ten years of age. Many excellent records have been made by cows older than this. The quality of the milk produced by heifers is somewhat better than that of older cows, for a decrease has been noticed in the average fat content for each year until the cows have reached the full age. This is caused by the increase in the weight of the cows with advancing age, At any rate, there seems to be a parallelism between the two sets of figures from the same cows. Young animals use a portion of their food for the formation of body tissue, and it is to be expected, therefore, that heifers will require a larger proportion of nutrients for the production of milk or butter-fat than do older cows. After a certain age has been reached, on the average seven years, the food required for the production of a unit of milk or butter-fat again increases, both as regards dry matter and the digestible components of the food. A good milk cow of exceptional strength kept under favourable conditions, whose digestive system has not been impaired by over-feeding or crowding for high results, should continue to be a profitable producer till her twelfth year, although the economy of her production is likely to be somewhat reduced before this age is reached.

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How Manures Influence Mutton.

A very exhaustive report, penned by Professor William Somerville, M.A., D.Sc., has been issued by the English Board of Agriculture, dealing with the series of experiments carried out since 1896, at Cockle Park, with a view to ascertain the influence on the production of mutton of manures applied to pasture. We append the conclusions to which the author of the report has come, and in perusing them our readers will of course bear in mind that the effects of the various manures have been tested only by the increased weight of mutton produced and not by any other standard. The information is interesting even if not applicable to any great extent to Australian conditions :—

1. Cake of various sorts was fed to sheep on pasture at 11 centres, and in no instance was the outlay on the cake recovered in the increased mutton produced by the sheep in the season when the cake was consumed.

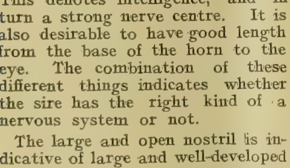
2. In the latter part of the grazing season sheep getting liberal allowances of cake did not increase in weight to a greater extent than those getting no cake, but which were grazing pasture improved by liberal dressings of basic slag.

3. The residual values of cake were occasionally higher than is usually estimated, but, in comparison with basic slag, cake residues had a poor ameliorative effect on the pasture.

4. Even when both direct and indirect effects of cake are taken into account, the original outlay was not recovered at two of the main stations. This result was confirmed at such of the minor stations as were concerned with this problem.

5. It would appear to be bad practice to feed cake on pasture containing much clover, as the nitrogen in cake residues has a tendency to repress the clovers by stimulating the non-leguminous plants.

6. Common burned lime, used alone at the rate of four tons per acre, has proved very ineffective but smaller dressings of ground lime, when added to a phosphatic



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dressing, have sometimes been justified.

7. Basic slag applied as a single dressing at the rate of half a ton per acre, has generally proved a most effective agent in improving the feeding value of pasture, and its effects are not nearly exhausted at the end of nine years.

8. It has proved much more profitable to apply a heavy dose of basic slag as a single dressing than to divide it into two equal portions and apply these with a three years' interval.

9. A repeated dressing of basic slag has, however, had a marked effect in some cases, and the productiveness of slagged pastures that are showing signs of exhaustion can be rapidly improved in this way. The action of a repeated dressing appears to be more rapid in many cases than the action of the first dose.

10. Basic slag put on in the middle of June had much more effect than the same quantity applied in winter. Whether this result is of general application can only be determined by further experiments.

11. Where a direct comparison has been made between the effects of equal quantities of phosphoric acid derived from basic slag and superphosphate respectively, the former manure has always produced the greatest amount of live weight increase. When the cost of the manure is taken into account, the profits from the use of basic slag have always been much greater than those from superphosphate.

12. Potash added to a phosphatic dressing generally resulted in the production of more live weight increase, but this increase was not a profitable one. The expediency of using potash on pastures—as contrasted with meadows—therefore, receives no support from these experiments.

13. The addition of moderate dressings of sulphate of ammonia or nitrate of soda to land already treated with phosphate has increased the yield of herbage, but has, as a rule, reduced the yield of mutton. The use of nitrogenous manures on pasture would, therefore, appear to be bad practice.

14. Dissolved bones compare badly with basic slag and superphosphate. This is doubtless due to two reasons :—(a) the slower action of part of their phosphate and (b) the presence of nitrogen. But the nitrogen of dissolved bones, being less active than that of sulphate of ammonia, the general effect on the sheep of the dissolved bones has been better than that of a mixture of superphosphate and sulphate of ammonia. The use, however, of dissolved bones on pasture would seldom appear to be justified, and especially so as their phosphoric acid costs more than the same substance in basic slag.

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Cooling Farm-Separator Cream.

One of the greatest objections urged against the hand-separator is that the cream gets too sour before being delivered to the creamery. This condition is brought about by not properly cooling the cream and keeping it cool while on the farm. With such soured cream in all stages and conditions it is an impossibility to ripen it properly so as to make a first-class article of butter.

Dairy authorities continually urge the cooling of cream as soon as separated, and not to mix fresh warm cream with cold cream. The advice is good, and must be followed to produce a choice grade of cream, either for the creamery or the private dairy. But it seems that very little is ever said about how this cooling should be done, or the methods or utensils necessary for cooling cream on the farm. Many, I fear, let their cream set and cool the best it can, ofttimes in the open air and dust in a room or cellar where many offensive odours abound. It is no wonder that cream treated in this way and delivered twice, or even thrice, a week is off flavour and quality, and the farm-separator blamed for it.

Separator cream must be cooled suddenly and at once after separation, and to a degree at least as low as average well water. At that temperature souring, or ripening, is very slow, and the cream will remain practically sweet for several days. Cooling in the open air is a dead failure, even in the best cool cellar or cave. Cooling by contact with cold water is the only method that will rapidly carry off the heat and preserve the cream from deterioration.

The submerged can for setting milk so largely in use before the days of the separator produced as good a grade of cream as it is possible to secure in any way. This was brought about by the rapid cooling of the milk and cream in contact with cold water. For large dairies where several gallons of cream are to be cooled no better method can be adopted than the large water-box and the cooling-cans, holding 4½ gallons, held under the water by a slat over the loose ventilated lid.

For small dairies, where but one or two gallons are to be cooled, the best method I have known is the one I have practised, of lowering each skimming of cream directly into the water of the well. A very simple arrangement of cans enables me to do this safely, without danger of spilling or getting water into the cream. The can I use is the common tall 3-gallon ripening cream-can with lid fitting over upper edge to shed off dripping water. I had a tinner cut a one-half-inch hole in centre of lid, and solder in a tin tube about one inch long, to come up close under hand-hold. This for a ventilator, for you know it will not do to shut up warm milk or cream in an airtight vessel. My cream is run directly into this can, and then lowered into the well, where it sinks into the water as deep as the cream in the can.

For a handle to raise and lower, and to prevent can from turning over, I use a light sawed pole one inch square, long enough to stick out above well-curb to allow for different stages of the water. This pole has two straps nailed to it near the lower end, one just right to buckle into the bail, and the other about right to buckle around below middle of can.

Nearly every farm has an open well, that may be arranged for this use. Where a pump is used a trap door may be made in the platform, and not interfere in the least with drawing water. Placed in cold water in this way the cream will soon cool, and germ growth be checked. Here it may remain an hour or two or all day or over night. Then it is to be added to former batches in larger cans, and kept hanging close to the water in the same well. The practice of this method will prove to the butter-maker that farm-separator cream is all right. Since practising this method we have noticed a great improvement in the texture of our butter.—American Agriculturist.

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Concerning Calves.

One of our constituents who has had much experience in stock-raising, and who has approached the subject from both a practical and a scientific aspect, writes Elder's Review, states that as a result of his researches he has laid down the following deductions regarding the sex of calves. The sex of the offspring is determined by the parent which has the greatest sexual vigour at the moment of impregnation. That is to say, if the sire be the more vigorous, the offspring will be a male; if the dam, a female. There is a certain time when the cow is at her best for mating, and at such time she is most likely to assert herself, and the calf to be a heifer. If you mate before or after that time the bull has a better chance to fix the sex. It would generally happen that a young and vigorous male would be very strong most of his time, especially as owners are generally careful not to overwork the young males. On the other hand, the old male, having passed his prime, would have less strength and inclination, and the female would, in nine cases out of ten, be the stronger. Beyond this the age of the animals does not help. This same authority quotes his experience of a large preponderance of females from a sire in the first year, about 90 per cent., and from the same sire, by reducing the number of the females in the second season, 90 per cent. males. In the first case there were so many females that the advance came from them, and in the second from the sire.

To get heifer calves, the sire and dam have been brought together when the latter was at the top of her heat, and but one connection has been allowed. This has proved successful in every case, and in one instance, when applied to a cow in good condition, six years old, and with her fourth mating, put to a bull two years old, the result was a heifer. This cow had previously had twin bull-calves, and was in poor condition when mated.

Calf-raising should be part and parcel of the dairyman's business, for it is absurd to suppose that any dairyman can rely upon buying as good cows as he can raise. He need only retain a few calves each year, and dispose of the less promising ones. He has the advantage of knowing the breeding of each, and need save none but those from his best cows. A prominent and successful dairyman has furnished some particulars to a contemporary. These go to show that he can raise a heifer to the age of two years at a cost of £4, including the value of the calf at birth, and he has been offered £10 for some of his two-year-old heifers. Another dairyman who has successfully managed a large herd of cows for several years estimates the cost of raising the average calf at £3 15/- per annum. But even allowing £8 to raise a heifer to the age when she begins to give milk, she will then be the equal of cows that would cost £10. Instead of a clear advantage of £2 per head, the chances are that the actual added profit in the line of the home-bred and home-raised cow will be nearer £5. Another great advantage in raising heifers is that the dairyman may feed them in the correct manner to develop them to their greatest capacity. Heifers that are properly raised are much more efficient as cows, and therefore worth more than if they had not been so raised. If breeding goes for anything, it means that the cow's quality of large milk production is likely to be transmitted to her daughter. This has been so thoroughly established by thousands of tests that it admits of no argument, save that a milking history on the side of the sire is of equal importance. The prevailing plan of not raising the calves has the same ultimate effect on the dairy business as it would to destroy a good cow whenever one meets such. It is a deliberate policy of remaining stationary, or even of retrogression, instead of advancing.

Nobody else has so many natural advantages as the dairyman for raising good heifers, and nobody else has the same interest in it, or is likely to succeed so well at it. If he can take further advantage of the deductions put forward by one of our constituents, he can depend upon making a very bold forward move. To give up calf-raising for any other method of replenishing the herd by purchase or exchange is sheer wastefulness of many great natural advantages. When the dairyman appreciates the above proved facts he will not only save his best heifer calves, but more of them. Preserving the female progeny of the most valuable cows is one of the fundamental and essential elements of the most profitable dairying. That it is not more generally done is one of the vital defects in local dairying, and one largely responsible for the poor or very ordinary results too often obtained on our dairy farms.

◆

Testing Seed Maize.

Any kind of a shallow box filled with soil and divided into little squares, will do for a tester. On each square place three kernels from different parts of one ear—and so on until the box is full. Each square then represents an ear, and the ears are numbered to correspond with the squares. Slightly press the kernels into the soil, and stretch a wet cloth over all. On this lay another cloth, and cover the latter with soil about half an inch deep, packing it down carefully all round to exclude air. For the sake of cleanliness put another cloth on top, and sprinkle water on this—about two quarts daily. Keep the box in a warm place in the house, and in about a week the kernels will have sprouted sufficiently to show which ears are best.—"American Farmer."

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The Future of the Horse.

— English Live Stock Journal. —

The horse is declared by some people to be doomed on account of the extending use of tramcars, motors, and motor 'buses. The impression is fostered by the noisiness of the innovation, and the compulsory idleness of many horse vehicles. "Cab, sir," is frequently uttered to inattentive ears, as the newly-arrived passengers in many towns make their way to the trams. Horses of a certain class are cheap, but, on the other hand, hunters and agricultural horses are dear. It therefore seems as though electricity and petrol have affected the value of some classes of horses, but not others; and the question as between horses and mechanical power is by no means settled. The public is not unanimous in opinion as to the relative merits of the two systems. A great number of people look upon trams, motors, and motor 'buses with intense antipathy. They consider them dangerous, noisy, ugly, and nerve-shaking; that they injure the roads and depreciate the value of property near the highways; and that they are injurious to hay and other crops, and destroy the beauty of hedgerows and trees. The letters which appear every day in the daily papers are often couched in the strongest possible language, and yet the "nuisance" grows, and probably will continue to. There will be improvements, and in a few years many of the objections may possibly be met. Still, at the present time they undoubtedly exist, and the idea that our old friend and companion the horse is being gradually thrust out of existence is sometimes expressed. Hunters and polo ponies are safe, although the novelty of motoring has proved in some cases attractive.

Tfhe principal fact against the view of the extinction, or even the considerable diminution, of the horse is that there are more horses in the country now than there were six years ago, and, probably, more than at any previous period. Whether there are more in the towns it is impossible to say, in the absence of a horse census, but the agricultural statistics are against the idea of extinction. So is the price of oats, which are essentially horse-corn, for no cereal has kept up in value better, in spite of foreign competition. Hay is not likely to be cheap this winter, so that neither of the principal horse foods afford indications of diminished demand. That hay has been cheap must be attributed to superabundance, owing to successive good crops, and to foreign competition, largely due to the high prices of three or four years since. Many farmers at that time went in exclusively for hay growing and selling, and spoiled their own market; but hay is now likely to be dear again. It would be a great misfortune to agriculture if horses were generally supplanted by motor power, but there are many reasons why this fear is not likely to be consummated. The present craze for speed and dust is inconsistent with true pleasure, and we may soon see a reaction. The horse has many advantages which it may be well to mention. He is a unit of power which can be much more conveniently applied than motor power. We can drive one horse in a light trap, or two horses in a four-wheeler, or three or four in a brake; whereas the many-horse-power motor must be used as one individual at a very considerable waste of energy. Again, horses are less liable to breakdowns and accidents, and do not require repairs, but only rest. Neither are they subject to the same depreciation in value as a machine, and may increase in value, while motors must depreciate, and that very rapidly.

So far as agricultural horses are concerned, there are no complaints, for good horses of this class are at a premium. The convenience of horse-power on farms is even more marked than in the case of carriage horses. One may be used to draw a waggon or cart, and the power is easily doubled, trebled, or quadrupled without waste. The horses are not puzzled by soft ground, which entails two or three instead of one, and they are easily cleaned and kept in good order. They have stood their ground wonderfully against steam, and may be relied upon to stand against motor power. Besides, they are cheaper than mechanical power. They may be managed so as to be profitable, as a £40 three-year-old may become a £60 four-year-old, and an £80 five-year-old; but a five-year-old motor would be difficult to dispose of at any price. Horses are adaptable to any sort of farm work. They can cut the corn and carry it, plough the land, and drill the seed, and haul out dung over muddy roads without clogging or breaking. They make manure, and return a large proportion of their food to the land. They live well upon fodder which is not of the most saleable sort, and eat up the lighter oats which would only fetch a low price on the market. They graze rough ground at little expense, and, in fact, their cost cannot be estimated on the basis of ordinary market values. There are, therefore, many advantages to the credit of horses beyond a hard-and-fast calculation based on the market prices of hay and corn. The depreciation owing to age is very light, not amounting to more than £2 or £3 a year on an average, and the risks from accidents, disease, or death are not heavy. On the other hand, the depreciation, supercession, and risks of motor-power are simply incalculable, as an improvement in mechanism may quickly reduce the price of a machine to that of old iron. We may therefore say with confidence, "Long live the horse!" May he continue to reap our harvests and plough our land, to carry us, and trot before us on the road. There is room for him as well as for motors, and there is no reason why both should not exist together, each in the sphere most appropriate to its peculiar advantage.

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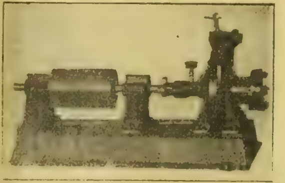

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Variations in Quality of Milk.

The importance of recognizing the variations in the quality of milk which are natural ones cannot be over-rated. The fact that a definite legal standard has been fixed, below which milk may not be sold, is only one phase of the matter. It is in the interest of the farmer to know accurately what variations take place from time to time in the quality of the milk given, both by individual cows and by the herd as a whole. With this knowledge at hand he can take steps to remove or modify the circumstances which tend to lower the quality, or at least he knows which circumstances causing the variations can be safely ignored, and which need immediate attention in the interest of both the milk and the cow and of his own pocket.

Of the factors which tend to produce such variations, the period of lactation—that is, the length of time since calving took place—is one over which no control can be exercised. The loss of milking-time, owing to calving, is, on an average, from six to eight weeks. This leaves, roughly, the usual 300 days as the length of the milking-period. One investigator has expressed the variation in the quality of milk during this period by dividing it into three equal periods. He finds that during the second period the milk was 17 per cent. richer in fat than during the first, and during the third it was 40 per cent. richer than during the first. The term "variation in quality" has in practice almost become limited to the variation in fat present in the milk, though the albumen and casein and the ash and sugar should also be taken into consideration. Since, however, the ash and sugar are found under widely varying conditions to vary very little, while the variations of the albumen are equally slight, there remains only the casein and the fat to consider. It has been found generally that in average milk, where the percentage of fat lies between 3.0 and 4.5, the changes of casein keep a practically constant ratio with those of the fat. Taking all these points into consideration, it is clear that in knowing the changes which occur in the percentages of fat present we have in brief a good idea of the varying quality generally, and it is this fact which justifies the conconsideration of the fat present being regarded as fairly indicative of the character of the milk, so far as all its constituents are concerned.

One other method is adopted of indicating the change in fat content, according to the interval from calving.

The general effect of becoming pregnant is to lessen the tendency to give milk. The first is considered to be merely a sympathetic effect which comes into play immediately upon conception taking place, and is probably slighter in its effect on the production and yield of the milk. The second is purely physical, and is caused by the withdrawal of the blood from the udder in order to ensure the full nourishment of the growing young.

This is naturally not marked at first, but steadily increases, and by the time the fourth or fifth month of pregnancy is reached it is the essential cause of the diminution in the supply of milk. There are, as would be expected, considerable variations from this in individual animals, varying from those who hold out in such a way that the effect of becoming pregnant is little or none, to those who, during the whole period, are practically useless as milk-producers.

The variations in the fat content of the milk after the calf is dropped, and after the colostrum has ceased, are such that from the third or fourth week to the seventh or eighth month the fat remains practically constant in quantity. Yet there is a definite variation noticeable in the character of the fat globules.

Early on in this period the globules are much larger in size, and, as the distance from parturition increases, these gradually diminish in size, but at the same time so increase in number that only very slight variation is observable in the total fat present. Early in the period the cows are often out at pasture, and the character of the fresh food materially aids another characteristic of the milk. During that period the fat is found to contain more of the soft olein, which may even rise up to as much as 50 per cent. of the whole fat present, whereas the normal amount of this is only about 34. As time goes on this slowly diminishes, and the proportion of the harder fats, shearin, and palmivin increases, until from 50 per cent. the olein may drop as low as 20 per cent. This natural variation is intensified by any change from fresh to dry food, which may take place at the same time, and which also tends to increase the proportion of the hard, and lower that of the soft fats present.

A second cause of variation in the fat content of the milk is as "natural" as the one above mentioned, and its modification is just as far beyond the power of the dairymen to effect. This is the difference between first-drawn milk (fore milk) and last-drawn milk (strippings). It is well known that a wide difference exists between the extremes, and the first quart drawn may show a percentage of a little over one, while the strippings will frequently rise as high as 10 per cent., being thus ten times richer in fat than the first-drawn milk.

The old explanation of this was simple and natural and very probably incorrect. It regarded the milk as naturally creaming itself while lying in the udder; the cream naturally rose to the top, and the lower, the first-drawn portions, were thus a sort of skim-milk, while the last contained the cream, and hence showed such a large increase in fat.

A more correct explanation is probably that the large globules of fat which tend to make the proportion of fat rise highest move much less readily along the milk-ducts than the more watery portion of the milk. The latter, therefore, is first out, while the slower-moving fat globules come on later. This slow movement will also be still further retarded as the udder becomes distended with the earlier milk, and considerable pressure is thus exerted on the milk-ducts along which the slow-moving large fat globules have to pass.

Another assisting cause is suggested in the probable re-absorptive action of the lymphatics upon the milk which has been long standing in the milk-cisterns. This absorptive action is naturally slow, and hence is apparent more clearly in the milk which has come first into the udder and remained there a considerable time before being drawn as the first-drawn milk. The later milk, which has been in the udder a considerably shorter time, has suffered to a less degree the absorptive action of these lymphatics, and hence has retained a much higher proportion of fat.—"Lactissima," in the Mark Lane Express.

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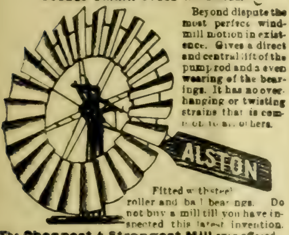

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Leaky Teats

Mr. D. Hutcheson, Acting-Director of the Department of Agriculture at the Cape, in answering a dairy farmer whose well-bred Shorthorn cow was suffering from leaky teats, first explains the functional arrangement of the teats, and then proceeds to suggest treatment for remedying the defect.

He says that in the normal condition there is a layer of muscular tissue—arranged in circular and longtitudinal bands, situated between the inner or mucous lining of the teat, and the outer coat or skin. It is this layer of muscular tissue which contracts and closes the duct which passes through the teat from the udder, and prevents the flow of milk when the gland is at rest. This band of muscular tissue is strongest at the base of the teat at its junction with the udder, where it is most needed. In some relaxed and flabby udders this muscular band has lost its tone, and does not contract with sufficient force when the udder becomes filled, and the pressure is increased.

The treatment usually adopted is (a) to prevent too much pressure by milking the cow three or four times within the twenty-four hours, and (b) to apply an artificial elastic band round the top or base of the teat. This has to be carefully and skilfully done to prevent serious injury to the teat. If a narrow elastic band is fixed tight round the base of the teat, it interferes with the cirulation of the blood, and causes the teat below the band to swell, while the band itself produces acute irritation and an inflamed hollow ring. In order to avoid this, it is necessary to apply the band uniformly round the whole teat, so that it fits like the finger of a glove without the tip, the pressure being merely sufficient to keep the duct closed, and prevent the bandage from falling off. A broad elastic band, such as is used for ladies' garters, if cut the exact length, and the ends sown together neatly, can be fitted on without much trouble. The pressure requires to be very light. It is necessary to keep two or more of these bands clean and dry, so that a fresh one can be put on after each milking, and see that the teat is also kept clean. The most important thing is to avoid too tight pressure; very little is sufficient.

◆

Does Food Increase Butter-Fat?

The question was supposed to have been settled years ago. Recently, however, it has been discussed pro and con., and once more become a live topic. Not long ago a report was issued by the Wisconsin Agricultural Experiment Station, showing that the amount of butter-fat a cow gives is not altogether dependent upon the nature of her food, although foods rich in protein are the most capable of giving the best quality and also the largest quantity of milk. More recently another report has been issued by the Agricultural Experiment Station of Cornell, dealing with the same subject, and covering a period of four years. A herd which had the reputation of being insufficiently fed was selected. A record of the production of the herd in milk and fat was then kept for one entire lactation period on the farm of the owner, without in any way changing the conditions under which the animals had lived. Rich feeding was then given for two years, and then poor feed again. The results show that during the whole time the cows were on a liberal diet the milk was one-quarter of 1 per cent. richer in fat. This is stated to be an equivalent of about 6 per cent. of increase on the butter yield. Well, this is practically no increase at all.

In the case of cows which have been insufficiently or poorly fed, it is reasonable to expect that a more liberal feeding would increase the percentage of fat up to a point limited by the individual characteristics of each cow, but beyond this no additional feeding would be likely to have any effect. Thus we are brought back to the original proposition that the quantity of food does not materially influence the butter-fat in the milk.—Exchange.

◆

Care of Sows at Farrowing Time.

Sows which are in pig may run together up to within two weeks of farrowing time; then it is advisable to separate them, placing each sow by herself in a yard with a small lean-to shed, which must be dry, airy, and clean. A great deal of exercise will not now be necessary. It is best to reduce the feed somewhat, and if there is any tendency to constipation a slight change of feed may be necessary. If individual sheds are not available the sows cannot be separated until near farrowing time.

Farrowing pens are all the better for being provided with fenders around three sides, about six inches from the floor, and about eight inches from the wall. These must be strong enough to support the weight of the sows should they lie on them. In a large measure these fenders protect the pigs from being lain upon during the first few days of their lives. In themselves they go a long way towards preventing a very fruitful cause of loss among young pigs. The little fellows soon learn to creep under these fenders when the sow lies down.

The period of gestation is about 112 days from the date of breed-

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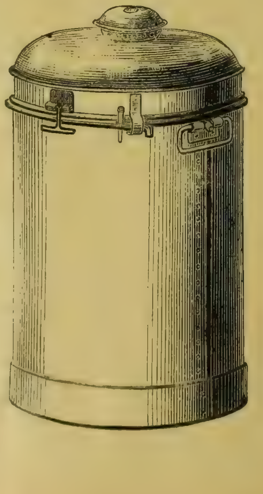

ing, and a record of dates should be kept to avoid mistakes, which are likely to result in loss of pigs. As farrowing time approaches the sows need carefully watching so that assistance may be given if necessary. However, if a sow has already farrowed a litter, and has been properly fed and cared for during pregnancy, little difficulty need be feared. With young sows, particularly those of immature age, there is a considerable element of risk at this time, not only to the pigs, but to the sows themselves. The bedding of the sows at farrowing time requires to be sufficient only for cleanliness and dryness. When bedding is furnished in large amounts the pigs will burrow into it and get lost or be crushed by the sow. The best bedding is wheaten straw. It is as well to have assistance at hand at farrowing time, but on no account should the sows be interfered with if they are getting along nicely alone. Many pigs may be lost every year from lack of attention during farrowing, but, on the other hand, over-anxiety and too much attention may do more harm than good, and result seriously. The assistance most needed at this time is to help in cases of difficult labour, and to protect the newly-born pigs from becoming chilled. Some farmers make a warm nest for the little pigs in the bottom of a basket or tub, placing a few hot bricks or stones in the bottom, and covering with bagging to prevent too rapid radiation of the heat. Unless the sow objects too seriously the pigs are placed in this receptacle as fast as they arrive. They do not suffer by not being allowed to suck for a few minutes and are dry and warm when placed to the teats. When farrowing is over the pigs are placed to the teats, care being taken that each one gets its share. As soon as the afterbirth is passed, it should be immediately removed and buried, and the hind-quarters of the sow thoroughly washed with warm water.

If the weather be very cold, remove the pigs to a warm place after they have sucked, to prevent their becoming chilled. As newborn pigs suck as often as every two hours during the day, this entails considerable inconvenience, but it often means the difference between profit and loss. In a short time the pigs are able to fight their own battle with the cold, unaided by any but their own warmth and that of the dam.

During the first twenty-four hours after farrowing, while the sow is yet in a feverish condition she will, as a general rule, show little, if any, inclination for food, and will need none. Give tepid water to drink as she wants it, but never allow her to drink cold water at this time. The feeding for the first three or four days must be light and carefully given, about ten days being occupied in getting the sow on to full feed. From this time on it must be remembered that the sow's system is working under full pressure to supply not only her own bodily needs, but milk for her young, and the supply of milk must be kept up in quality and quantity if good pigs are to be raised. Fresh air and exercise are essential to both sow and young, but in very cold weather it may be necessary to let the pigs reach the age of two weeks before turning them out.

By the time the pigs are three weeks old their appetite for something besides the sow's milk may begin to assert itself. This time will vary, as some pigs are more precocious than others. They will be noticed rooting around and investigating the sow's feed. A pen should be arranged adjoining that of the dam and separated from it by a partition, with sufficient room at the bottom to allow the pigs to run under. In this enclosure a small trough should be placed, and a little skim milk or thin gruel placed in it. The main point to be observed is that the pig's stomach is very easily deranged at this age, and feed must be given that will digest readily, thus insuring the rapid growth and health of the young animals.

As the pigs learn to eat the feed may be increased. If they have been judiciously managed for the month after they first begin to eat, and are taking feed in amounts sufficient to make them more or less independent of the sow's milk, weaning will not be a difficult process, and will be brought about so that it will be scarcely perceptible so far as the effect on the pigs is concerned. The time to wean will depend upon the way the pigs are eating. If they are not thoroughly accustomed to grain and skim milk, the time must be delayed. If there is no occasion for breeding the sow, no harm is done by allowing the pigs to run with the mother to the age of twelve weeks or older.—Elder's Review.

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Official Poultry Work.

—(Contd. from September Issue.—

In a previous paragraph we mentioned some of the points which a reasonably organized competition might by this time have been expected to have placed beyond the possibility of discussion. Another and more important one on which much information might have been obtained is the comparative production of birds in their first, second, and third year. True, a good deal of evidence has been forthcoming through the Hawkesbury competition, which has more or less confirmed the opinions generally held by poultry breeders, but Hawkesbury is far away and is merely a name to the great majority of poultry producers, who, in any case, do not have much opportunity of studying the valuable data which has accumulated during the last few years. It is, of course, trying our poultry officials pretty high to compare their work with that of an up-to-date man like Mr. Thompson, assisted by a live committee, but still the fact remains that whilst Hawkesbury has been up and doing Roseworthy has been stuck in the same old rut. A little while back we referred to the often quoted "oversea advertisement," which the Roseworthy competition is supposed to give this State. It is somewhat significant that when Australian competitions are mentioned in "foreign" papers it is nearly always Hawkesbury which is referred to, yet Gatton, Roseworthy, and Subiaco have put up better scores. Hawkesbury is, in fact, regarded as the poultry centre of the Commonwealth. Roseworthy, in foreign opinion, is merely "a village lying to the south," as we once saw it described, and the pre-eminence given to Hawkesbury is due to the fact that the management there has not been contented to play follow my leader round an endless, profitless circle, but has, instead, organized and carried out some original work. What a chance of much distinction in the poultry world the Poultry Section of our Department of Agriculture missed when it went to sleep five years ago. It is time somebody woke it up even if it has to be done with a boot.

In a letter recently received the writer says, "What you suggest is all very well, but how can it be done without upsetting the object of the competition?" We do not suppose that even the Poultry Department—if it were less sound asleep—would suggest that any mild departure from precedent, such as we suggest, would be impossible, though it is likely that it would say that it was "too tired," or words to that effect, at least its continued inaction would lead any unprejudiced observer to that conclusion. For the benefit of our correspondent we might mention the possibility of reserving a certain number of pens for experimental purposes—the occupants of at least 30 per cent. in every past competition would better grace Sandford's Auction Mart than a laying competition. In alloting pens give preference to those who could make a reasonable claim to having "a stake in the industry." Require these selected breeders to forward nine birds in place of the usual number. Select the competition six by lot. The surplus threes could then be divided into three, six, nine, or any number of flocks which would be as equal as it is possible to arrive at. By this means you have first class material for useful comparative work in the reserved pens. An even more simple and equally effective plan would be to give all the pens a run for the first three months. The first half at that date, or those above a reasonable limit to continue, the remaining moiety to be split up and used for some reasonable purpose. Competitors would squeal—Well, let'em. There are, of course, other and perhaps better ways of getting there, but the above are suggestions we made in this paper before the Department took that sleeping draught, and they don't seem any more impracticable now than they did then, at least they don't to us. It may be argued that competitions are not intended for experimental work; well, all we can say, is, they ought to be. At all events it is up to somebody to enquire whether the present waste of time, money, and opportunity at Roseworthy, is to continue for the term of our natural lives. We have been told that the expert is too busy to undertake the work. If so, relieve Mr. Laurie of all supervisory work in connection with the competition. That Mr. Day would be overworked—this, by the way, we believe, would be no new thing for Mr. Day. Well, relieve him of all duties other than competition and comparative work. Appoint a consultative committee of two or three non-competition poultrymen to discuss possible openings for experimental work with him and then let him go ahead with a free hand. We know Mr. Day to be a keen observer, capable of recording his observations clearly and we believe that his work under such conditions would be of immense value to the poultry industry.

In writing as we have done we have not, of course, the smallest desire to belittle Mr. Laurie's ability. As a lecturer we have been informed that he is wholly admirable. As an organizer we need only say that he has apparently not permitted his natural genius in this direction free play.

Another correspondent has just weighed in. The burden of his song is Denmark and the Danish egg

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rade. We need only say that hen S.A. is within a few hours f London. When she can land esh, not frozen eggs there. When ur average summer temperature rops 35 degrees. When distances re measured by furlongs not iles. When wages for handling ggs are paid in pence instead of hillings. When our standard of ving is reduced by half, we shall e pleased to talk Denmark as a ir standard of comparison and a easonable guide to South Austra- an possibilities. Till then we hall leave such piffle severely lone.

We must not forget to write a ord in reply to another corres- ondent who accuses us of "hav- g no sympathy with a progres- ve policy in poultry work." The ord we should like to write ould be "Rot," but that might ot be considered polite. Need e say once more that we have ny amount of sympathy with a rogressive policy on well con- dered lines. What we have al- ays objected to is a policy of xpansion with no definite outlet. Progressive policy" cackle is all ight for politicians. It will be emembered how some of them andled the infant Egg Circle (as ng as it was healthy) before an mused, if somewhat sceptical pub- c. Do they, we wonder, ever stop shed a tear or lay a handful f simple wild flowers on its little rave—at the Produce Depot. rogressive policy is good talk for he Poultry Department, for it ind of justifies its existence. It good talk for the press, for it lls their advertisement columns. t is good talk for the modern tility breeder, for it brings cus- om. It is only moderately good alk for the store keeper and mer- hant who, however, are said to anage "to get in out of the wet." nless we get the London market, nd we seem a long way off, it is ar from good talk to the farmer nd casual producer, for the State as been and is choke full of eggs lready and it is absolutely bad nguage to the poultry farmers ho, when things readjust them- elves after last year's upheaval the poultry business, will prob- bly find themselves between the evil and the deep blue sea, or omewhere near it. We grant, of ourse, that a progressive policy ould be all right for the poultry rmer if some philanthropist ould lift a million dozen a year ut of the State and place them London, but though the Government did their little best last year, ia the Port River, they are not kely to voluntarily repeat that hastening experience. By the way. why did those thousands of dozens of circle eggs which went into cold store at the Depot in good order and condition, find the resting place they did. Perhaps, as the Port Depot has been tacked on to the labours of the Light Square Parliamentary Commission, we shall know more of the history of the "rejects" some day. The printed evidence before the last commission left off at a rather interesting point. Be that as it may, the Government, in this matter of the poultry industry, appear to be in danger of finding themselves in a tight place when things settle down in the egg trade, and prices will be watched pretty keenly by those interested in the development of the situation. So far, probably the late autumn laying and the light winter egg crop have tended to naturally keep up prices, but now that the glut season is at hand we may see a fairly smart slump, in which case the egg producers, and especially those induced to join the egg circle by hopes of a glorious future, will feel very cross, and will probably express their feelings with some violence. In effect they may be expected to say: "Drat the Government, two years ago they promised to ship eggs to London and all sorts of things were going to happen if we would provide them with nice, clean, fresh eggs. Well, we did this, and if they liked to chuck them in the Port River, that was their look out. Anyway, what are we to do with our nice, clean, unfertile eggs, and what is the other fellow—who followed our example and came in, and also fell in, too late—to do with his nice, large, clean, unfertile eggs." So, in sheer decency, the Government will have to step in and buy nice, large, clean, unfertile eggs till the cows come home. These they will have to store for the casual egg, even when certified by its owner to be large, clean, etc., cannot qualify for London, and on the evidence of the egg circle affair eggs won't pay for gilt edged handling. How to get rid of them will surely be an awkward question, for even the Minister of Agriculture will probably recognize that a repetition of the chucking idea does not commend itself as a customary commercial practice, however desirable as a temporary expedient. On the other hand they may decide to let the bottom drop out of the market in which case it certainly will do so, though this catastrophy may be delayed by the competition of Adelaide merchants who, with one eye sharply on the profits of the butter, cheese, and general produce business, are said to occasionally close the other optic a trifle, as far as direct profit from eggs is concerned. But the downward trend is certain unless the Government can put up a big enough scheme to lift ten thousand dozen a week, not only out of the State but out of the Commonwealth; and on present outlook their chance of doing so is about equal to that of the famous Mr. Buckley. Yet, in the face of this, they erect model poultry farms, they sell supposedly superior poultry from Roseworthy, they subsidize or conduct utility poultry shows and in other ways, tacitly and directly encourage the increased production of a commodity of which the State is already overfull, and for the disposal of which they have made no provision. On Farmers' Day at Roseworthy, it is said that visitors were impressed with the poultry pens, but it is not reported that anybody said to Mr. Perkins, "It's a grand object lesson, old chap, of how to spend money on poultry, but what are we to do with the eggs when we get them." Nor is any answer to such a question reported. What would it have been? What, in fact, is the only possible one? Will somebody tell us?

(To be Continued).

TICK

South Australian poultry owners have found that the very best remedy for the TICK CURSE is

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An English Poultry Farm.

When Mr. J. J. Gabb left for his trip to England he was good enough to say that he would occasionally let us know of his doings amongst the English poultry yards and shows. We recently received the following letter :—

"After a pleasant voyage home in the Orvieto, which left South Australia on April 21 I arrived at my old home in Gloucestershire on May 26. Everything looked beautiful, and the weather was delightfully warm. I have been looking around the poultry yards hereabouts, but by far the best and most up-to-date I have yet seen, is that at Coaley, belonging to Miss N. Edwards, one of the pioneers of the day old chick industry, which has grown to such immense propertions here in the old country. This farm is about 12 miles from Gloucester, and consists of about 28 acres of orchard and well grassed meadow land. On June 2, after a five mile walk through the fields and lanes I knew so well, I found Miss Edwards at home. "Yes," she said, "I am only too pleased to be of use to anyone interested in poultry. We will start here first," and opening a door, entered a room 43ft. long by 12ft. wide and 16ft. high, with windows high up, about 12ft. from the floor. This is the finest incubator room I have ever entered. It accommodates ten 50-egg, twelve 100-egg, and two 200-egg incubators, which are arranged on an open frame round three sides of the room. The walls of the room are decorated with a fine display of coloured plates of the different breeds. Now for the breeding pens. First came a large field containing 22 pens, in the construction of which over two thousand yards of wire netting was needed. Each breeding pen is 25 by 25 yards, and there are eleven of these ; also eleven smaller ones of 25 yards by 5 yards. At the time of my visit these yards are nearly all empty as the breeding season is now practically over, but in the paddocks are droves of young stock, from a few days to 4 or 5 months old ; of the following varieties : — Buff Orpingtons (these are first favourites) White Wyandottes, Silver Campines, Buff Leghorns, Coaley Buff Game, Speckled Surreys, and Coaley Fawn Ducks.

First, the Buff Orpingtons. Miss Edwards particularly specialises in these—they are Buffs that are not easily forgotten. There are hundreds of them, cockerels in one paddock, and pullets in another, the early pullets in well shaded runs, which are moved on to fresh grass every day.

Next the white Wyandottes, large flocks of them and pure white, still, I think our White Wyandottes hold their own with any I have seen here. In the next paddock are some very good Buff Leghorns, of good type and sound in colour, these are old favourites with Miss Edwards, and she has hundreds of young stock of this breed. Silver Campines are another variety which have held their place out of about forty breeds tested. I noticed pens of the older pullets standing out for very perfect markings. The adult birds of this breed are larger than any I have seen in Australia. Miss Edwards says they are wonderful layers of good size eggs. I made acquaintance with the Coaley Fawn Ducks, which originated here, on a pond where there were fifty or more of them together—a very pretty sight. They are very like the Buff Orpington Ducks but the darker head colouring of the drakes gives them a more bronzed and handsome appearance. They are larger than the Indian Runner but equally good layers. They are certainly very ornamental.

Miss Edwards is fortunate in having large roomy farm buildings. A large barn filled with comfortable box pens makes a capital exhibition house. Another shed affords housing for the broody hens, whilst a third is used as a fattening shed and food house. In my round of these sheds I was struck with the attention to detail shown.

Miss Edwards, I learnt, has a number of resident pupils and expects to increase this side of her work. Thirty pupils studied here during 1910. All reside in the house which is large and comfortable. Inclusive terms being 30 guineas for 12 weeks. Miss Edwards is, as you know, a large exporter and exhibitor."

◆

How Crooked Breast Bones Affect Market Prices.

The time of year is now rapidly approaching when a large number of chickens will be running about, and thus care should be taken to keep their breastbones straight and of good shape. There are two causes of bent breastbones—allowing the chickens to perch when too young, and owing to hereditary causes. The latter cause suggests its own remedy, and the utmost care must be exercised to see that the parent stock do not possess this very serious defect. When selecting the breeding birds each one should be examined in order to see that the breast bone is perfectly straight, as, if not, the fault is almost certain to be transmitted to the chickens. The other cause is due to the birds being allowed to perch when too young, which, invariably, results in crooked breastbones. Until the chickens are about four months old they should sleep upon the floor, which should be covered with straw, sawdust, litter, or some similar material.

KOONOOWARRA POULTRY YARDS.

Barred Plymouth Rocks : Special Exhibition pen. Ckl, 1st and Sp. at Victoria P & K. C. Show ; 1st and Medal Essendon Show, Vic.; 1st and Sp. Adelaide P. & K. Club Show, 1911 ; Hens and Pullets, all winners, P. & K. C. Show, Adelaide, 1911. A limited number of settings only. £2 2s. per setting.; Good Utility, £1 1s.

Buff Orpingtons : Birds have won prizes whenever exhibited. Good sound color and healthy stock ; also good winter layers and splendid birds for Export trade. 10s. 6d. and £1 1s. setting.

White Leghorns : My Roseworthy pen averaged 220 eggs per hen, and are now mated to cockerel of well-known laying strain 7s. 6d. per setting

White Plymouth Rocks : Snow-white birds, easy to breed and rear, typical Farmer's fowl, good Winter Layers and excellent Table Birds. A few settings only to spare at £1 1s.

White Orpingtons : Imported and prize-winning stock. Won 1st Ckl, 1st Pullet Royal Show, Adelaide, September, 1910. Great Winter Layers and good Table Birds. 10s. 6d. and £1 1s. setting.

Pekin Ducks : Never beaten in show pen. Four Firsts, 1 Second, 2 Sp. at P. & K. Club Show, Adelaide, 1911, out of five entries. Two Firsts, 1 Second and Special at Royal A. & H. Show, Adeleide, Sept 1910, out of three entries. A limited number of Settings at £2 2s. Good Table Birds, specially mated, suitable for Export trade, 5s. per setting. Reduction for quantities.

Eggs securely packed and delivered on Rail or Coach (buyer pays carriage). All Eggs Stamped Koonoowarra. Infertiles replaced once.
Terms : Cash with Order. I keep nothing but A1 Stock. I cull heavily and breed only from the Best.

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If there is any danger from rats, a shelf should be provided, about six inches wide, upon which the chickens can roost. It is the narrow perches that do the mischief and result in bent breast bones. It should be remembered that the breastbones of young chickens merely consist of muscle, and the weight of the body resting upon it has the effect of speedily putting it out of shape.

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Best Breed.

An inquirer asks which is the best breed for him to keep, as he has a good market for both poultry and eggs. It is impossible to answer the question directly. There are so many good varieties that it is difficult to point out the best. Indeed, the one best breed is the one that the purchaser decides to take up. This he must stick to, for he will make a failure if he keeps looking about all the time for something better than he already has. A good strain of White Orpington should suit him as well as anything.

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A Word for the Cochin.

In looking round at the poultry shows held during the past 20 years one cannot help noticing the absence of what are usually termed fancy breeds. Their places have been filled, and as a rule filled well, by modern creations of feathered stock. Yet there is a feeling in many minds that the once highly-appreciated birds, valued perhaps only for their form and plumage, should not be placed among the forgotten things. They were dear to the hearts of many of our most esteemed fanciers, and they are dear to their memories still. Of late years, perhaps from necessity, we have been worshipping at the shrine of the Golden Calf, and the blessed word utilitarian has become our fetish. Yet it may be expected that the wheel of fashion may alter its position, and may again bring prominently forward those breeds that so worthily engaged the attention of our older fanciers, writes "Chanticleer" in the "Australasian."

Who does not remember the Cochin—the emperor of the showroom? Gentle, majestic, massive, the Cochin was easily first in popularity, and that fowl was greatly the means of making poultry shows popular. The history of the bird, so far as it is known, is interesting. Specimens of the breed were first shown (in Dublin, I believe), in 1843, by Her late Majesty (Queen Victoria). They became at once popular. But the breed was not available to fanciers until 1847, when they were brought from China to both England and America. Shortly after they were frequently exhibited, and what was then known as the "poultry mania" set in. Large sums were then invested in the breed, and it was no uncommon thing for 100 guineas to be paid for a single cock. When it is remembered that poultry shows in those times were both irregular and infrequent, and, consequently, the rewards for high-class poultry were of a meagre character, it says much for the hold the Cochin had on a fancier, who dipped so deeply into his pocket. In the language of a poultry writer of those days, "Men went mad about Cochins, and spent small fortunes in procuring them; and all England, from north to south, seemed given over to a universal 'hen fever,' as it was humorously termed. Their advocates would have it that the birds had no faults. They were to furnish eggs for breakfast, fowls for the table, and better morals than even Dr. Watt's hymns for the children, who were from them 'to learn kind and gentle manners,' and thenceforward to live in peace."

As a matter of course, this high plane could not be maintained. The Cochin is not a perfect bird; nor has the poultry millennium even yet arrived when a single breed will establish a record in eggs, and produce a perfect market fowl, to say nothing of setting a code of gentle manners and of imparting a high moral tone to the community.

Nevertheless, the Cochin is, if properly kept, a fair layer of rich, brown-coloured eggs, and, when young, is a good table fowl. It is easily kept within bounds, and does not delight in exasperating those poultry keepers who delight as much in their garden as their fowls. On a grassy sward a flock of Cochins is a beautiful sight, their rich-coloured plumage, as well as their dignified presence, adding a charm to the scene that is most pleasing.

Hints.

An ounce of prevention is worth a pound of cure, so it is better to observe the precautions necessary to prevent roup than it is to wait until the disease has taken a firm hold on the flock of poultry, then try to eradicate it.

Early rising, active hens are invariably your best layers, and are usually first to occupy the nests, and where trap nests are not in use a great deal of improvement in laying qualities can be gained by using only the early laid eggs for hatching, writes an Exchange. I have never seen this point accented, but any one else who uses trap nests will bear me out in saying that almost always the hens with the best records are also the hens who lay earliest in the day.

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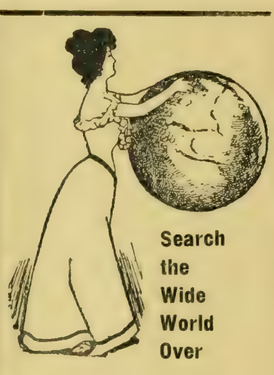

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Wyandottes at the Show.

To the Editor.

Sir.—Though I have not hitherto favoured the proposal to adopt the score card system of judging put forward by our club, I must confess that the placing, or rather, misplacing of the birds in the Wyandotte classes at the Show last week is a strong argument in support of a different method of adjudication, for I do think that had the judge put down on paper his ideas of the values of individual points of the birds he handled, he would, in many cases, have arrived at a different estimate of their relative merits. Need one point to a more glaring instance of error of judgment than the carding of the Silver Wyandotte cocks, for instance. If you will grant me space, I should, in the interest of the fancy, like to make a brief comment on some of the classes individually. To begin with Gold cocks. I do not exaggerate when I say that the winner was the worst bird in the class, whilst Mr. D. McPhie's birds in pens 834 and 832, in that order, were undoubtedly the best. In Golden hens, I admit Mr. Maude had a poor lot, and in selecting the winner he did not go far wrong, she was of a nice colour and well laced, but small and mean. (Our correspondent might have added that the bird was as clean as a whistle in her centres, very neat in head and of typical shape. In any case, Mr. Maude could not help her size and she was undoubtedly the best bird in the class.—Ed.) Silver cocks I have referred to already. In my opinion Mr. Cope's bird in pen 857 stood alone for quality—of grand shape and sound colour, he was miles ahead of the winner which was simply a Sandford "potter." In Silver hens, I admit the winner was a good bird, but she certainly failed to the bird placed second in type, soundness of colour and quality of lacing. Number two was of the best type in the class, splendid colour, extra good at throat and breast and very clean in cushion. An easy winner. In cockerels, number two should again have been on top, being of better type and size, good bone, splendid wing and great top colour. In placing as he did Mr. Maude was probably led away by the extra fine hackles carried by his pick, but with a score card to guide him he would have got a better grip of the birds as a whole. In Silver pullets, number two again unlucky. In White cocks a good bird won. In hens, however, the real winner, in pen 884, though a gem, was not placed, whilst the bird getting the award was merely a beautifully shown white bird, not a Wyandotte at all, being heavy in cushion and too loose in fluff. White cockerels and White pullets were well placed. In Partridges the winning cock was a grand bird, splendid in colour and type. One of the most typical Wyandottes in the Show. Hens were a rotten lot, and the Columbians were worse.—I am, yours, etc.,

Member of the Wyandotte Club.

(The criticism of show awards is a somewhat profitless occupation and usually leads nowhere. For instance, we have three other letters on the same subject and written in the same tone, but, strange to say, two of them find most fault with the two young classes in Whites which M. of the W.C. considers to have been well placed. When experts differ, where shall peace or finality be found. As they have not signed their names for publication they will probably excuse this brief reference to their opinions.—Ed.)

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Utility at the Show.

To the Editor.

Dear Sir.—When down at the Show last week I made it my business to hunt up the Utility section. What a variegated collection! By the way, have not the names of Cope, Eldridge, and Treloar a familiar sound? To find them and the best Silver Wyandotte pullet, amongst that hotchpotch, was a bit of a shock. Oh yes! Within the letter of the law, no doubt, but what about the spirit? Also, how came a Bantam to annex a special as a utility fowl. More power to the Bant., of course, but what about the judge. Please, Mr. Editor, enlighten my darkness on these points. Also ask Mr. Laurie not to hold up the Utility fowl to ridicule again, and further oblige by requesting some of the competitors to read the standard and wash their birds before next show.—I am (and was)

"Very Amused."

(Before answering his questions we may perhaps be permitted to remind "Very Amused" that Rome was not built in a day, and further, to point out that he has overlooked many encouraging features about the section which he refers to. It was, at all events, a beginning and a pretty numerously attended one at that. With regard to the names mentioned we can only say that if anyone was fool enough to leave £30 of easy Government money lying around loose, small blame to anyone for

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ıbbing some of it. With regard the Bantam, we can only surse that the Government has beme so sick of the big egg prosition that it is starting out to courage the production of small es. As to the judging. What uld Mr. Jamieson do? Our ultry expert will have to evolve standard and scale of points fore a judge can do anything fore such a motley assembly—cept laugh—Ed.)

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A Helping Hand.

We notice that we are not alone trying to disturb the slumbers the Roseworthy Competition anagement, for "Hardshell," in recent Journal, makes the sugstion that competitors should be ked to answer a series of quesons as to the breeding of their rds, etc., when sending in nomin-ion papers. As this would be actically a duplication of the rms we used to send out and ıblish in connection with competions some years ago the proposal turally has our blessing, for it undoubtedly gratifying to find e's good example followed, even ter many days. Still, we are ping for something a little more -to-date, something, in fact, ith even a suspicion of novelty out it from so influential a arter. Having thus ventured to et his feet, as it were, in the atter of criticising anything offila, we have hopes that our iend will muster up courage to ade in a bit deeper, though to ethrone the fetish before which he s so humbly bowed for many ars, will doubtless be a wrench nd to sit outside the radius of e official smile, a novel experince. Still, we can assure him hat the position is quite a comrtable one, it even has some lvantages.

Broken Beak.

Not unfrequently, from some cause or other, a fowl will get one of its mandibles broken. If such a bird is allowed to run about and rely on picking up its food as usual, it will have great difficulty in doing so, and its general health be much injured through inability to obtain sufficient sustenance owing to the great pain caused by the broken beak coming in contact with the hard ground. The course to take is to pen the bird up, feed on soft food only, giving a large supply, placed in a fairly deep vessel. What remains after each feed should be removed.

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Floor Space.

Reply to "Backyard."—No doubt keeping fowls wholly under cover has many advantages for poultry keepers situated as you are, and you can certainly carry more birds to any given space when that space is roofed than when it is open. As to the space required per bird, that is a difficult point to answer. It would depend somewhat on the breed and on the care and cleanliness with which you looked after the stock. Probably in allowing 10 square feet of floor space per bird you would be on the safe side. This is borne out by the record of the only experiment which we know of, which has been conducted to settle this question. The conditions of this test appear to have been thoroughly well arranged and the 15 pens engaged seem to have been started fair. The results were that four lots of 15 pullets each in houses 16ft. by 10ft., which works out at 10.6 square ft. per bird, averaged 65 eggs each during the term of the test. Four lots of twenty each in houses of the same size gave 60 eggs for each bird. With four lots of 25 each under the same conditions the result was 51 eggs, whilst 90 birds divided into 3 lots of 30 each laid only 40 eggs apiece. Thus it will be seen that the average net profit steadily decreased as the number of hens per pen increased. Note is made of the fact that there was a marked equality of laying between the pens of equal numbers and this certainly indicates that "space" was a controlling factor in production. To save readers the trouble of working out the "space per hen," we will do it for them. In lots 1 each bird had 10.6 square feet of space; in lots 2, 8 square feet; in lots 3, 6.4 square feet; whilst the 90 birds of lots 4 had to be contented with 3½ square feet.

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Black Orpingtons
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Breeding From Immature Hens.

Many failures in poultry keeping are put down to a variety of other causes, which are in reality the result of breeding from stock not sufficiently developed—stock which would eventually have been thoroughly reliable for the purpose, but which failed to give satisfactory results owing to its too early use. Disease and loss of vitality are very frequently caused by the use of immature birds in the breeding pen.

The late hatching of birds for breeding purposes is at the root of the evil. The breeder is tempted to sell his early birds because a better price rules for them than for the later ones, and to depend on the latter for his next season's stock. We are frequently told that second season birds produce stronger and finer offspring than do cockerels and pullets, and undoubtedly this is so if the latter are not thoroughly matured. They should be somewhere about eleven months old when bred from, and then they are capable of producing chickens quite as hardy and vigorous as those from stock a year older.

Neither is it a question of exactly the number of months of the bird's age; the eleven months must commence at the right time of the year. Late-hatched specimens never attain the same robustness and hardiness of constitution as do those hatched in the early months of the season, and this for more than one reason. It is not only because the early spring is the best and most suitable time to raise the strongest chicken, but because at that time the vitality of the parents it at its best, and has not become weakened by the heavy strain of a long-breeding season.

The chicken that can best convert its food into bone, flesh and muscle is the one that will eventually make the finest specimen. To do this, it must have vigour and power of assimilation, and this will be found in its prime only with these hatched early in the season and fully developed.

Of course, if there is maturity on one side, such as the mating of adult hens with a young cockerel or a second-season cock with late pullets, the results will not be so bad as when weak immature cockerels and pullets of the same age are mated together, but there will be a proportionate weakening of vitality in the offspring.

Degeneration is bound to follow the use of immature birds, and will be worst and most rapid when young, undeveloped stock is used on both sides; and if continued for several seasons the chicks will die off in large numbers, whatever care and attention may be bestowed on them, and very often all sorts of things will be put down as the cause besides the correct one.

Mature mating will not do it all. There must be proper care, feeding, and general management, and all the requirements of Nature must be attended to if things are to turn out well, but all these will not bring success if a proper amount of vigour and vitality are not present in the parents when the egg is produced.

In-breeding may be a great evil if improperly carried out; but ill effects from this cause will be less likely to occur if the stock used is of a mature age and properly developed.

The poultry keeper who desires to produce the finest and healthiest stock must look well ahead, and before disposing of the early hatches, select therefrom such as will be required for the next year's breeding stock, putting them carefullv aside, and not forgetting to do them well right along, then when the next year's breeding season comes he will be ready for the production of strong healthy chickens.

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Farmers' Fowls.

Farmers', fowls, by reason of the special advantages that they enjoy over flocks kept in town yards, owing to unrestricted range, abundant insect food and unlimited grain ration to be had for the searching, should prove vastly superior to town raised birds in every individual respect. That no such superiority is ever present examination of the average farmer's flock will disclose, but rather that deterioration is the most prominent feature in their connection. The farmer (says the "Poultry Bulletin"), with that fine disregard for what he is pleased to term "fancy feathering," most resolutely sets his face against anything in the line of a reliable pure-bred strain and affects the nondescript for his poultry requirements, arguing all the while that fowls are far too unimportant to engage his attention or make serious call on his giant intellect.

In the rare cases wherein he unbends from this cast-iron mode of procedure and deigns to invest in a pen of pure-bred stock, his notions of economy impel him to secure the cheapest quality available, and he is thus saddled with specimens decidedly inferior to his ordinary farm-raised mongrels.

Handicapped thus, it is scant matter for surprise that the majority of farmers unanimously agree in denouncing poultry raising as a profitless pursuit, and

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American "Ringlet" Strain. Barred to the Skin.

Winnings last year:—8 Firsts, 7 Seconds, 6 Thirds, and 2 Trophies for Best Rock in the Show.

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BLACK ORPINGTONS.

In Black Orpingtons we can offer Eggs from our best pens, in which our noted winning "Sargenfri" King "Sargenfri" Prince blood is well represented, at usual prices, £2 2s. £1 1s. and 10s. 6d. per dozen.
High-Class Young Stock.

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We have 400 well-bred young Leghorns ready for Customers. They are birds of good quality, and will turn into healthy, vigorous, heavy-laying stock. (N.B.—"Sargenfri" Leghorns lay standard size eggs every time. Eggs from all Pens 10s. 6d. per dozen,

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Unbeaten in the Show Ring and Splendid Layers. A Fine lot of Typical Young Stock for Sale. Eggs 10s. 6d. per dozen.

C. J. CHANDLER (Near Glynde Hotel) East Payneham.

cite their own individual experience as proof of the accuracy of their contentions. It never occurs to them that their failure might, even in slight measure, be the result of ineptitude on their own part, or due to the total unfitness of the particular stock handled, rather than to the general unprofitableness of the poultry race.

Given good stock, of creditable productiveness, there is no reason why the farming community should not raise poultry culture to the position of the most lucrative undertaking on their holdings and derive a considerable amount of both pleasure and profit from the raising of stock of the highest quality. Before this desirable consummation is ever brought about they will require to live down their prejudice against show birds and decide to become a shade more liberal minded in regard to the figure that is necessary to secure satisfactory foundation stock. They will, moreover, require to erect suitable buildings and maintain their flocks on a better footing to secure satisfactory results and conduct their poultry raising business on systematic and commercial-like lines. The extra advantage derivable from a close study of the market for farm products—with a view of obtaining the best possible price—is well understood by them, and the same system must be practised in connection with both fowls and eggs if satisfactory terms are aimed at. Haphazard methods of sending eggs or fowls to market have never yet succeeded nor will they ever succeed in regard to these any more than to other classes of products.

Equally with his brother breeder in the suburbs the farmer must employ intellectual efforts in improving and developing his stock along most desirable lines, and add to their productiveness by persistent and painstaking attention. He must be keen to discover the best layers in the flock, with a view of arranging for their reproduction, and equally keen on locating the drones to permit of their being got rid of at the earliest possible moment. Extra large, or specially choice table birds should also engage his attention relative to the best methods for their perpetuation, and all specimens intended for market should be yarded separately and fed in a liberal manner to ensure highest market value being obtained when sent forward for disposal. These are the details that count in a money-making programme, and that have served to bring into prominence the names of the leading breeders throughout the world. At a minimum expenditure of time and cash farmers are afforded the opportunity of thus placing their operations on sound and satisfactory lines, and would, in consequence, he speedily convinced that given a fair show poultry would prove the most valuable asset on the farm.

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Growth of a Fancy.

The growth of a fancy depends upon the multiplication of varieties, and the multiplication of varieties depends upon the extent of variations in individuals. Unless there are numerous varieties, a fancy is limited in extent; unless individuals vary in characteristics a fancy is impossible. In the field of poultry there are geese, ducks, turkeys, guinea fowls, and the common domestic fowls. Guinea fowls vary but little, and there is hardly the semblance of a fancy in them; geese vary a trifle but there can be hardly said to be a fancy in geese; turkeys are in nearly the same category with geese both as to variation and fancy; ducks vary some and there is a growing duck fancy, but the common domestic fowl varies greatly and the fancy is strong and well developed.

It is the aim of breeders to produce strains of fowls with excellencies so fixed that they will not vary materially, that first prize ancestors will produce first prize descendants for an indefinite number of generations. If it were possible to do this, it would be a great triumph in breeding, but it would at the same time be an utter defeat of the fancy in the varieties which had attained to this superexcellence, because then there would be left no room for the exercise of skill in mating and breeding, and this is equally true of the utility breeder. Any novice could mate these fowls as well as a veteran breeder.

Unless a fancy affords an opportunity for skill in breeding it can not live. What any one can do is interesting to no one. And a fancy must be supported by the interest of the fanciers. If the art of mating consists only in putting a male with a certain number of females, no skill is required, no expense is necessary. A boy of six will then be the equal of a breeder of sixty. No interest can survive such a test.

Variation then, is the breeder's best friend. It often disappoints him. It upsets many of his best plans. But it, also, opens the way of progress, it makes improvement possible, it creates interest in breeding, it affords a field for the exercise of skill, it makes possible and sustains a fancy. It is at once the despair and the encouragement of the fancier.

When matings "go wrong," when unfavorable variations appear and seem to undo the work of years, let the fancier take heart, because the force which makes for progress still exists and a different mating may produce the favorable variations upon which success is dependent. And then, too, it is well to remember that even seemingly unfavorable variations sometimes prove to be really favorable ones. They serve as a hint for further progress, in a new direction perhaps, and to even better results.

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G. T. MILLER, Kingscote, K.I.:—"The Incubator that I had from you has given entire satisfaction, it hatched 95 per cent. of the fertile eggs.

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The English Owl.

By F. R. E. Branston in English Stockkeeper.

To begin with, breeding English Owls must not be confounded with breeding Foreign Owls, as we have got far beyond that, and to cross them is utterly useless for breeding birds for the show pen. It sounds very well, but my advice is don't attempt it, as if you do you will probably get all the bad points of both breeds and none of the good ones, and find your birds come flat headed, long, clumsy, with thin beaks and small heads. What we want is a bird of good proportions in body, with a very large head and short in feather.

How difficult is the task of breeding a show specimen can only be realised by those who carefully endeavour to do so year by year and almost point by point, as by breeding for one point we often lose another, so that matching these birds must be carried out with the greatest care and judgment as to the manner in which they have been bred, as in such a way only can a strain of winners be kept up. A good Foreign Owl might be described as a bird with small dainty body and round head, but with the English Owl we must have a large body, but not clumsy, and a very large, round head, as a large bird with a small head never looks proportionate. Undoubtedly the most difficult points to breed are in the head, as a bird having a head with a good sweep, broad, and not flat on top, high over the eyes, and broad at the back of the skull, is very rarely seen in our show pens. For years I have been through the show pens for birds with heads like this, and I rarely see anything near perfection in that respect. In fact, I have begun to regard it as a sort of thing one reads about, but seldom sees. How to produce a bird with this kind of head to fix on our English Owls is about the most difficult problem which we have to solve, and until it is generally known the best Owls will continue to fetch very high prices. When we have got this head it is nothing much without the proper shaped, close fitting short beak, with wide gape, but I think one generally goes with the other—at least, I have found that to be the case—and a good beak requires no cutting or altering, as, unless it is set at the proper angle by nature, it cannot afterwards be altered, and if cut it only becomes what is called straight-faced, and makes the whole appearance of the bird mean. I am very strongly of opinion that a good beak of the right shape set on at proper angle is best left alone. Coarse wattle is a fault which has to be got over, as it is very unsightly, and in breeding for heavy-wattled birds great care should be exercised. The wattle sometimes hides a multitude of faults, as when birds get old and heavy wattled the beak faults are sometimes not so well noticed. Another bad fault, that of being pinched behind the wattle, is not so easy descernible; but I would rather breed from a bird coarse in wattle and good in the other head points than one flat-headed or straight in face, as wattle points are much easier to deal with. A good eye with little cere is always a good point, and can with care be easily bred. The gullet thickens with age, and often is shown more developed in birds bred from parents having very bad gullets. In fact, I would rather choose a bird to breed from having no gullet than one with a good gullet, so called, which had been artificially made. The frill, I think, has hardly enough attention given to it, as it might be very considerably increased, and when properly developed it is of great beauty, particularly in powdered blues, and it can be increased by matching birds with good frills together, as a rule, but I have also seen some of the best frills bred on birds whose parents had little or none. I always like to see English Owls with small feet, as this generally denotes well-bred birds of good strains, as a large bird with small feet is generally a good one. A short tail and flights, in my humble opinion, are absolutely necessary for a show bird, but in judging young birds some allowance should be made, as young birds look longer until they fill out, and what, as a one-year-old bird, looks long in body and thin-headed, will perhaps in two years' time be almost perfect shaped.

In fact, to be a good judge of young Owls it is necessary to have some considerable knowledge of breeding them, as there are certain signs by which one is able to determine as to whether a young bird will make up into a good two or three-year-old bird. On passing down the pens at shows there are many birds who show only their backs at first, and it is remarkable to see how many have broad backs just at the lower part, which is very ugly, and shows the trace of an Antwerp cross. This is a fault which spoils the smart appearance, and this also gives us the opportunity to observe the width of the back of the skull, which will often be found narrow and the neck thin, points to be avoided. There is no doubt that a considerable advance has been made with regard to the improvements in the type of the English Owls, but much more remains to be done, as up to this time the principal improvements seem to be in the head points.

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PIGEON SPECIALISTS,
Have bred some sweet 1910 youngsters in
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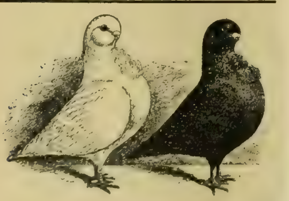

O.K. LOFTS.

This is where the Champions are bred. At 1911 Sydney Royal we won 2 Champions, 6 Firsts, 3 Seconds, 2 Thirds with 11 entries only. At S.A. Pigeon and Canary Show we won the "Blondinette" Cup, the "African Owl" Cup, against 15 others also the "Short-face Tumbler" Cup for best young tumbler, all with home bred birds, also a number of Specials, Firsts, Seconds, and Thirds. To give amateurs a start I have for sale Blondinettes, African Owls, Short face Tumblers, Nuns, Turbits, etc., from 5/- each. Fifty to clear before breeding season. Apply at once to—

E. A. GROSSER,
Hamilton, S.A.

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Practical Pigeon Management.

By Rambler.

This is just the very best time to give nestlings the best chance possible by keeping everything about them as clean as possible. Each day clean out the nests and sprinkle some fresh sawdust so that the squabs may be as cosy and comfortable as possible. Wash out the drinking vessels every day and scald them out once a month. I know I harp on this cleanliness business but it is a sure road to success. Keep up the shell grit, sand, and coarse salt supply also the green food. If you find that parents or feeders are neglecting their young you must hand feed. Always handle the youngsters gently. I forgot to mention that you should always put down the date when the second egg is laid as from that date it takes just 18 days to hatch the eggs. When you find the eggs just chipped on the 18th day and you look again in, say, four or five hours and find that no progress has been made it will be necessary to help the little prisoner with your thumb nail, but remember to stop at the first sign of blood. When the young ones are nine or ten days old put the proper rings on the left leg. If you wait longer it will be too late.

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Pigeon Notes.

By Rambler.

Mr. W. B. Viney has, I hear, received two pairs of Saddlebacks from Victoria, one pair of Black Stripes, and one pair of Black Spots. The former have gone to the lofts of a lady fancier, but the Spots remain with Mr. Viney. The quartette are from the leading breeder of Saddles in the Commonwealth.

The O.K. Lofts have suffered a rather serious loss through the death of the Champion Almond Tumbler cock, which was imported a year ago. Mr. Grosser is, however, making arrangements for importing a bird of similar breeding from the same English breeder.

Mr. R. Henwood, of Broken Hill, is another recruit to the Short-faced Tumbler fancy, having purchased two pairs from the O.K. Lofts. One of the birds, a red cock, is a winner in Sydney, and on this side. In addition, Mr. Henwood procured a white African Owl Hen, bred from champion stock.

I am glad to record that another amateur has gone in for "The Flower of the Pigeon Fancy," viz., the Blondinettes, for Mr. H. E. Chase, of North Adelaide, has recently received from Mr. Grosser a very fine pair of this charming variety. The hen was placed first in class at the last S.A.C. and P. Show in good competition. Mr. Chase writes that he is delighted with his bargain.

The stock of Blondinettes at Broken Hill have lately received a valuable addition in the shape of the Black laced cock, "Silver Cup," winner at this year's Canary and Pigeon Show, which has gone to the lofts of that sterling breeder Mr. W. J. Hughes, who, at the same time, purchased a prize winning Red Turbit hen, which is likely to be to the front in the Turbit fancy at the Hill. These birds were also from the Hamilton fancier.

I am, as I have previously stated, always pleased to get notes of their doings from anyone interested in the pigeon fancy. Quite recently I received a chatty note of his lofts and birds from Mr. Geo. F. Ball, and think the following extracts will be of interest to my readers. Mr. Ball writes, "I have thinned out my birds till I have only 30 left. They consist of eight English Owls, including the Champion Blue cock that won 2nd in Melbourne, and 1st and Spl., P. and K., Adelaide, last year, and also, as you know, 1st C. and P. and 1st, spc. and sp. for best bird in show at Port Adelaide this year. These are the only times he has been shown. He is a very massive bird, good in skull with splendid gullet and very short in feather. In fact, an Owl, every inch of him. I also have seven African Owls, including the hen that won at S.A.C. and P. Show in young class and at Port Adelaide in adult class. Then I have the adult Black cock. 1st S.A.C. and P. and 1st S.A. P. and K. Shows, also 2nd Port Adelaide. My eight Jacobins include Champion Black cock, 1st and spl. S.A.C. and P. and 1st at Port Adelaide in very hot competition. Most Jacobin men, I think, considered that he was the best Jack at the show but Mr. von Einem, the judge, evidently thought otherwise. Mr. Crotty won that spl. Then I have a pair of Ice pigeons. Hen, 1st C. and P. Show, 2nd P. and K. show, also Port Adelaide beaten by Mr. Crotty's Pigmy Pouter hen. I also have a pair of Nuns, black cock and red hen. I intend to shake things up in Nuns. My brother, who lives in Melbourne, has, as you know, some of the best Nuns in Australia, and I have myself, won many prizes in this charming variety. Just recently I have purchased from Mr. von Einem a pair of Blondinettes. These, with a few feeders, complete my stock of birds, but there are enough to keep up the reputation of the Stanley Avaries, and I have, I think, some young champions coming along."

Royal Show.

The display of pigeons at the Royal Show was certainly disappointing to those who had looked forward to a meeting of the crack birds of the year. As Mr. Maude, one of the best pigeon men in the Commonwealth, did the judging, the absence from the pens of representatives of many of our leading lofts was a pity, and it is not surprising that Mr. Maude confessed to some regret at the lack of quality of the bulk of the pigeons put up for his judgment. The following is prize list

Carrier, any color, cock, Miller and Martin. Hen, Miller and Martin. Pouter, any color, cock, E. Hefron; J. Porter; W. F. Hall. Hen, C. Porter; E. Hefron; W. F. Hall. Barb, any color, cock, F. E. Jurvis (1 and 2). Hen, F. E. Jarvis (1 and 2). Dragon, blue, cock, C. W. Creer; Mrs. H. L. Chase. Hen, C. W. Creer (1 and 2). Dragon, any other color, cock, C. W. Creer (1 and 2). Hen, C. W. Creer; H. R. Gelston. Baldhead, any color, cock, W. Tucker. Hen, W. Tucker. Beard, any color, cock, W. Tucker (1 and 2). Hen. W. Tucker (1 and 2). Jacobin, any color, cock, F. E. Jarvis (1 aod 2). Hen, E. S. Lewis; F. E. Jarvis. Saddleback, cock, W. Tucker ' J. Laing & Son. Hen, J. Laing & Son. Helmet, cock or hen, Miller and Martin (1 and 2). Trumpeter, cock or hen. Miller and Martin (1 and 2). Owl (English), any color, cock, Mrs. H. L. Chase. Hen, Mrs. H. L. Chase. Owl (foreign), any color, cock, Miller and Martin (1 and 2). Hen, Miller and Martin (1 and 2). Turbit, any color, L. P. E. Smith. Turbiteen, any color, cock, D. Cruickshanks. Hen, D. Cruickshanks. Blondinettes, any color, cock, W. B. Viney. Hen, Mrs. H. L. Chase; W. B. Viney. Fantail, white cock, E. S. Lewis; W. Benbow. Hen, H. G. Gray; E. S. Lewis. Fantail, any other color, cock, Tonkin and Fridy; L. and H. Brougham. Hen, H. G. and R. W. Loader; W. H. Gard. Magpie, any color, cock, D. Cruickshanks. Hen, D. Cruickshanks; F. E. Jarvis. Nun, any color, cock or hen, F. E. Jarvis (1 and 2). Antwerp cock, McMillan anh Fox (1 and 2). Hen, McMillan and Fox (1 and 2). Show Homer, cock, F. Goodwin (1 and 2). Hen, W. B. Viney; F. Goodwin. Working Homer, cock, L. P. E. Smith; McMillan and Fox. Hen, Mrs. H. L. Chase: F. E. Jarvis. Any other distinct variety, cock, W. Tucker; Miller & Martin. Hen, F. E. Jarvis; Miller & Martin. Boys' Classes. — Any variety, cock, G. and D. Cruickshanks: N. Jarvis. Hen, G. and D. Cruickshanks (1 and 2).

Notice to Amateur Pigeon Fanciers.

The Great Secret of How to Rear your Young Pigeons which may be neglected by parents or foster parents.

Address "Rambler," this office.

Home Notes.

Dangers of the House-Fly.

In recent years the part the common house-fly plays in the economy of a community has been emphasized by the work of health officers in all parts of the world. Formerly this insect was considered as merely a general nuisance—a dirty fellow fond of wallowing in slime, or a gay sipper fond of tickling the skin of listless summer lollers; but now it must be looked upon as a dangerous enemy of man, on account of the fact that it is the agent of transmission of some of the worst infectious diseases. It has been proved beyond doubt that the fly may, and does, spread the germ of tuberculosis (consumption) and the germ of typhoid fever, as well as those of the more common summer intestinal diseases, from one individual to another. Such being the case, it behoves us to guard against the enemy by taking such preventive measures as will reduce the liability to infection.

First of all, let us get a glimpse into the life-history of this great disease-carrier. The female house-fly lays its whitish wheat-like eggs in clusters of about 120 in decaying animal and vegetable matter preferably in horse manure. The eggs hatch in a few hours and bring forth maggots which continue feeding and growing in the decaying mass for about 6 days in warm weather before changing to pupae within brown pupa cases. After remaining about 6 days as inactive papae the adult flies emerge to begin a new brood. It will be seen then that as it requires 12 or 13 days in warm weather for a complete generation of the house-fly, the season's progeny of a single over-wintered female may be incredibly large. For example, if on September 1st one female deposits 100 eggs 60 of which are female and 10 survive to maturity, then on September 15 there would be 10 females, and on the same calculation, on September 30 there would be not less than 100, whilst continuing the process till 15th of January there would be 1,000,000,000 if they all lived and did their duty in the matter of multiplying their kind.

Secondly, let us examine the relation of house-flies to certain diseases. We notice that the maggots live and feed in manure piles and closets and other places of like character; the adult flies swarm from their breeding places to kitchens and dining rooms, where they are found on all kinds of foods. Germs gathered by the flies at refuse deposits are carried and left by them on their visits to the kitchen. In this way the disease spreads to healthy persons.

Thirdly, much can be done along the line of prevention by (1) the use of screens on all windows and doors to prevent the access of flies to the house; (3) the use of sticky, or under certain conditions, poison papers; (3) the proper disposal of horse manure every week to some dark place tightly screened, and the liberal use of air-slaked lime about the drains and gutters; and (4) the adoption of the dry-earth closet, where there is no deep drainage arrangements.

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2 tins Fruit in Syrup	0	0	6
1 metal box Linen Buttons, four-fold...	0	0	1
2 large bars Angel's Brand Soap	0	0	5
2 2-lb. tins Jam	0	0	6
1 lb. best White Starch	0	0	4
2 lbs. Japan Rice	0	0	4
1 lb. best Candles	0	0	4
1 lb. Currants, best colonial ...	0	0	3
1 lb. Raisins, best colonial ...	0	0	3
1 packet Borax, refined	0	0	1
1 card Bachelors' Buttons, fixed in a second, without sewing ...	0	0	1
1 metallic box best White Pins, ½-lb. size	0	0	1
1 4-oz. box Hairpins, assorted shapes, colors, and sizes ...	0	0	1
1 tin Fresh Herrings	0	0	3
1 tin Kippered Herrings ...	0	0	3
20-lb. tin, gross weight, our 2/- Tea, reduced to buyers of this parcel for	1	10	0
3 lbs. Dried Plums for	0	0	4
1-lb. tin best Baking Powder ...	0	0	3
	£2	0	0

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The Girl With the Ready Smile.

LOOK PLEASANT, PLEASE.

How many of us consistently take to notice this admonition of the photographer? It we fully realised how much a cheerful happy expression influences those about us, and what an important factor it is in our social success, we would take great pains to "look pleasant," or look as pleasant as we could. The face we turn to the world, the world turns to us again, and a cheery smile is of untold value in this work-a-day world. Of course there is a vast difference between the genuine smile that makes sunshine in the soul and shows us the joys of life and the grin assumed to hide our feelings. Expression is undoubtedly the highest form of beauty, since it reflects our character—our soul as it were. Happiness is contagious, worry or discontent repellant; therefore the happy, pleasant woman has the world at her feet. She is happy because she gives her whole heart generously without reserve or calculation, and joins pluckily in the fight—thinking above all of the happiness of those she loves. Young and old are equally charmed with the cheeriness and sympathy of her nature. Self is the great enemy of happiness. Provided she lives outside herself woman is invariably happy. "Laughing cheerfulness," once wrote a well-known author, "throws the light of day on all the paths of life." This is just what the happy woman does.

An unpleasant situation is half conquered when one has the sense to see its humour and laugh at the discomforts it presents. Nothing is so dark that it does not possess a lighter side, and the ability to discover and appreciate it does more to make one happy than anything else. It is the woman with the laughing eyes that scores socially every time. She seems to have a fund of merriment and humour that drives away dull care and lightens the heaviest burdens.

Discontent and worry are the greatest enemies of both a woman's good looks and her popularity. You hear people say, "I am of a worrying nature and cannot help it," but that is simply an acknowledgement of weakness. You can help it; all that is required is a little courage. That is all very well for the comfortably circumstanced, remarks the woman who has made up her mind to be unhappy, but those possessing nost of the world's goods are often he least satisfied. What about hat humble philosopher Mrs. Viggs who says, "Don't go and it sorry fer yerself. That's one hing I can't stand in nobody. here's always lots of other folk ou kin be sorry fer 'sted of yerelf. Ain't you proud you ain't ot a harelip? Why, that one hought is enough to keep me from ver gettin' sorry fer myself."

Suppose you try smiling instead f frowning at fate, for the person with pluck and willing to face fate nvariably turns a smiling face in he end.

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Home Hints.

— Lemonade. —

Pare the rind of a large lemon r orange, very thin, squeeze ll the juice out, remove pips, dd one ounce sugar, pour over his one quart boiling water; let tand until cold, strain and serve.

— Apple Barley Water. —

Slice a large apple, add the juice f a lemon, then cook until soft, nd rub through sieve, add to a uart of barley water.

— Oatmeal Water. —

One tablespoonful oatmeal, mix with a quart milk and water, stir ntil it boils, simmer for quarter f an hour, and strain, sweeten if esired.

— Barley Water. —

To two ounces pearl barley add teaspoons sugar, a thin lemon ind, pour over this one pint boil-ng water.

— Egg Drink. —

Beat a fresh egg with one teapoon sugar, boil one teacup sweet nilk, and pour on the egg, stirring he whole time; should be taken ot.

— Salt in Medical Use. —

Salt occupies a prominent place mong home remedies for common ilments. Dissolved in water and sed as a gargle it will cure an rdinary sore throat. Inhaled, it ives relief for a cold in the head. Where heat applications are needd a bag of it thoroughly heated s excellent, for it holds the heat nd does away with the moisture which is so objectionable. A cloth wrung from hot salted vinegar is standard remedy for sprains and ome put in the water in which ired feet are bathed, will be very elpful. When mixed with soda it elieves bee stings, and nothing xcels it for a dentifrice. A weak olution keeps the hair from fallng out.

Tried Recipes.

— Potato Soup. —

Boil four medium-sized potatoes until done, drain and mash them. Rub smoothly together 1 tablespoon butter, ½ tablespoon flour, and 1 teaspoon finely minced onion, make into a thin white sauce with 2 cups hot milk, stirring and cooking until smooth and well cooked. Then add the mashed potatoes and strain. Reheat, season to taste, and add a little chopped parsley. Above quantities are only sufficient for two persons.

— Tomato Cream Soup. —

To 1 quart good tomatoes allow ½ cup rice, 1 quart water, 1 pint milk, 1 tablespoon butter, 2 tablespoons flour, and seasoning. Put the tomatoes and the rice together in a granite saucepan, and cook until the rice is tender but not broken. Rub the butter and flour smoothly together, and stir into the cooked rice and tomato mixture. Cook until it thickens, add 1 saltspoon soda which has been dissolved in a little cold water, then add the milk, which should be boiling hot, and serve at once. Do not cook a moment longer or it may curdle. Serve with dry toast. This is fully equal to oyster soup, and also very nourishing and digestible.

— Cream of Celery Soup. —

Wash the celery, cut into small pieces, and boil in a little water until perfectly tender. Press it through a sieve, and to 2 cups celery add 3 cups milk. Thicken with the well-beaten yolks of 2 eggs, add 1 tablespoon butter, bit by bit, and seasoning to taste. Cook just long enough to set the egg. Just before serving add 1 cup cream.

— A Wassail Cup. —

Peel and core a big apple and cut it into quarters, sticking each with a clove, add a strip of lemon rind, half dozen lumps of sugar, and a pint of water, let it simmer gently for about a quarter of an hour, then add three-quarters of a bottle of good raisin wine, and let all heat together without boiling, pour into a bowl and serve with a ladle.

— Rhubarb Charlotte. —

Take any stale pieces of bread you have, and soak them in cold water for half an hour, then squeeze the bread as dry as possible. Well grease a mould with butter, and line it all over with bread, then put in a layer of rhubarb and sugar, and repeat until the mould is full, having a covering of bread on top. Bake slowly in a moderate oven for one hour and a half. Turn it out and serve with boiled custard.

— Banana Snow. —

Take six good ripe bananas (not dark); cut and slice and then mash as fine as possible. Add the juice of one lemon, the white of one egg, and whip to a cream. The longer the mixture is whipped, the more banana snow you will have. When nearly done, add two tablespoonsful of sugar and whip until sugar is dissolved. When ready to serve, add walnut kernels on the top.

— Date Trifle. —

Select three dozen large dates, wash them, dry with a cloth and pick out stones, lay them in an enamelled stewpan with 2oz. sugar, the finely-peeled rind of a lemon, a stick of cinnamon, and just sufficient light claret to cover them. Bring nearly to the boil, and let simmer gently, turning the fruit frequently until it is soft and nearly all the liquid absorbed. Then let the dates get cold. To finish, set a China dish over ice or in a cold larder, and arrange the dates on it. Over them place a layer of macaroons, and pour over all gently a pint of rich custard flavored with vanilla, in which one ounce of gelatine has been dissolved. Whipped cream may be piled on top.

— Pineapple Cream. —

Take a tinned pineapple, slice it thinly, and pound it in a mortar. Make a syrup with ½lb. of loaf sugar and half a pint of water, and add to the pineapple, and strain through a sieve. When the mixture is cold, add gradually one pint of whipped cream. Serve very cold.

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Pianos and Organs for sale at Cheap Prices.

— Baked Bananas With Cream. —

Bake as many bananas as required for 15 minutes, but take them up before the skins break, split them, remove the skins, and curl them into rounds on plates, put a teaspoonful of raspberry jam in the centre of each and serve with whipped cream.

— Prune Batter. —

Beat two eggs to a very light froth. Put two tablespoonsful of flour in a basin, with one of castor sugar, a teaspoonful of salt, and half a teaspoonful of baking powder. Stir the flour smoothly into the egg with a wooden spoon, and mix carefully, keeping very smooth. Add by degrees half a pint of milk, and beat well. Grease a pudding basin, put into it about three tablespoonfuls of chopped prunes that have been stewed, pour the batter over, taking care that the basin is quite full. Tie a cloth over, and cook in fast boiling water three-quarters of an hour.

— To Candy Lemon Peel. —

The rind of lemons can be used for this after the juice has been used for other purposes. Remove all the pith, and soak in strong salt and water for 48 hours, and drain them quite dry. Make a strong syrup of about 1lb. of sugar to every quart of water, and when it is boiling put in the lemons and stew them gently until quite soft. Take them out, and as they cool sprinkle well with sugar. When quite cold and firm, put them into a close tin for use.

— Pineapple Fritters. —

Take a small pineapple, small wineglass of brandy or liquer, two ounces sifted sugar and some batter. Pare the pineapple thinly, cut into thin slices, soak them in the brandy and sugar for four hours. Have the batter ready by mixing half pound flour, one ounce butter melted, two eggs and little cream. Break eggs separately, beat butter with flour, add pinch salt and enough cream to make thick batter, well rub it to break any lumps; add well whisked whites, beat up few minutes. Have ready a pan of boiling fresh lard or dripping, lay the pine in batter and fry a nice brown five or eight minutes. When done dish up, drain and lay them on a white d'oyley, strew sifted sugar between and on top and serve immediately. Sufficient for four persons. This is a delicious dish.

(Continued from Page 237).

Victorian Pigeon Notes.

By Blue Rock.

Breeders have their lofts in full swing and the cry of the squab is loud in the land. The month has furnished some peculiar weather, and I hear that in one loft almost a whole round of eggs was lost.

A movement is on foot to form a Fantail Club. The prime mover is Mr. Frank Crotty, and most of the prominent breeders in this variety have agreed to support it. Properly managed nothing but good could come of it, and it deserves success.

The committee of the Victorian Pigeon Society has dismissed the protest entered by Messrs. Woodward & Mead against the passing over of their birds in the Magpie section because they were young birds in old bird classes. The award was given on the ground that the judge's decision is final, but the exhibitors were considered to be well within their rights in showing the birds as they did. It is intended that next year the schedule will have "Adult" and "Young Bird" classes. This will settle the question, and will incidentally make it impossible to show unrung birds.

As a fancy the Carrier has practically become extinct in Victoria; this is to be regretted as this bird is undoubtedly very taking to the eye, and very charming in the show pen.

I hear faint murmurs of a movement to establish an Australian Magpie Club. The rumours are very indistinct, but I have no hesitation in saying that such a body would be a distinct gain. In fact, specialist clubs in all varieties exist in England and America, and make for the welfare of the fancy as a whole.

Readers! **Can you write us something about your methods of breeding, rearing, and managing Live Stock? Let us have it if it will only fill the back of a Post card.**

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The Editor will be pleased to receive correspondence and answer questions. These replies will, for the most part, be sent by mail, unless received just prior to date of publication.

PUBLISHING DATE.—On the 25th of each month preceding title date.

DISCONTINUANCES.—Responsible subscribers will continue to receive this journal until we are notified by letter to discontinue, when all arrears must be paid.

Dahlias.

The old method of planting dahlias early in the spring is giving way to the better practice of late planting by which the flowers escape a good deal of the intense heat and high dry winds which are so destructive to them, besides which with late planting we get the blooms at a time when they are, if anything, more appreciated than during the gorgeous display of midsummer flowering annuals. With the hardy old show type, time of planting does not perhaps greatly matter, but with the cactus, single, paeony flowered and pompone types any time within the next six weeks will be time enough for the plants to get in their best work. If one has any choice of position in the garden let the dahlias have a place which is open and sunny but protected, if possible, from the worst of the wind, for their very brittle stems are liable to break and more staking than is absolutely necessary is apt to detract from the grace of the plant as a whole. The Dahlia is one of the most hungry of garden plants and with the more robust sorts it seems almost impossible to overdo the watering and manuring, but with the less vigorous kinds, whilst plenty of nourishment is desirable a certain amount of care is necessary, or one may have one's dahlias running to a lot of sappy growth with few flowers. Most people who make a speciality of dahlias will already have the beds prepared, but if this has not been done it is well to remember that these plants very much appreciate a deeply dug root run. As good a plan as we know of is to double dig the bed or position the plant is to stand in, give it a good soaking and in a week's time spread a layer of cow manure three or four inches thick over it and dig this in. If you have time and energy to give it one more digging it will not be wasted effort. The dahlia is not a plant which can be squeezed in any odd corner nor can they be crowded together if the finest blooms are to be grown. Four feet apart each way is the least that the larger growing varieties should be planted whilst two feet six inches will be about right for the pompones. The beginner in dahlia culture has the choice of three methods, for he can either buy dry tubers, green plants or seed. In the case of large root clumps which require division this should not be done till growth has started, this can be hastened by placing in moist sand in a warm place. As soon as the shoots are showing divide the tuber so that each has one or more growths—one is quite enough. These divided portions can then be planted out in permanent positions or if these are not ready they can be potted off and grown on for a time. Green plants supplied by nurserymen are simply cuttings made from tubers started into growth some few weeks before hand. The amateur gardener can do this for himself if he wishes to work up a stock of any particular variety. To do so take off the young growths as they come from the mother tuber with a sharp knife when they are two or three inches long. Pot these singly in small pots or round the edge of large ones, using a rich compost with a good deal of sand in it and top the pot off with half an inch of pure sand. Sink these pots in a hot bed if one is available, if not they will root, but not so quickly in any warm shaded place. Raising dahlias from seed is perhaps the most interesting way of all for one does not have to wait long for results and the element of chance comes in. One may get something unexpectedly good, on the other hand it is just as well to be prepared for disappointment when the blooms come. Sow seed before the middle of the month using a good sandy loam in the pots or seed box and remember to sow thinly for it usually germinates very freely. When the little plants are well up and are showing four leaves pot off singly into four inch pots. Grow on in these till they are making good headway and the roots begin to fill the space and then transplant to an open bed which has been well prepared. Set them out not less than twenty inches apart each way and stake, water, and mulch.

In the Show and Cactus types there is a very wide selection to choose from. In singles of which the Giant Flowered are to be much preferred. White Cloud, Hall Caine, Crimson King, Golden Glory, and 20th Century would be a representative lot. In Paeony-flowered Miss Gladys Dawson, South Pole, Miss Watson, Merveille, Geisha, and Dr. Van Gorham would give satisfaction; whilst in Pompones Censor, Ideal, Prefect, Queen of Whites, Nerissa, and Kitty Barrett might form the nucleus of an interesting collection.

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Great Root Development.

A Laura subscriber writes:—"I am sending you a photo of a perennial Morning Glory showing the way it developed itself. This plant sent out lateral shoots for several yards in various directions, some finding an opening in the cover of the well descended vertically for 22 feet until they reached the water and then developed into the mass of fibrous roots shown in the picture, the plant yielded a grand display of bloom all through the long dry summer for which we could not account until the secret was accidentally discovered." We are obliged to our correspondent for his interesting note and for the photo which is not, however, quite suitable for reproduction. Even under more ordinary circumstances this plant is one of the most useful in the whole catagory for garden decorative purposes on a big scale and we can well understand that with the water supply mentioned above it must have presented a glorious appearance.

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Occasional visitors to the city from the country, who would like to know of a comfortable house when in town, are reminded that excellent accommodation is now obtainable at the Hamburg Hotel. The Hamburg, has, of course, always been a popular country house, and is therefore well-known to many of our readers, but since it was taken over by Host Flannagan some notable alterations and improvements have been effected. These include the addition of 16 bedrooms, and the practical refurnishing of the building throughout. Hot and cold baths are obtainable at all hours, and the electric light has been installed right through the house. The proprietor, Mr. J. Flannagan, who is well-known throughout the State, and particularly in the north, has the happy knack of making his visitors feel thoroughly at home, and we feel sure that those who avail themselves of his hospitality will have no reason to regret it. The Hamburg is most conveniently situated for both pleasure and business. Letters and telegrams receive careful attention, and when desired visitors are met at the railway station.

Wall Gardening.

— How to Build. —

From "The Gardening World."

To those only who have seen the beauty of these almost rare gardens is it possible to look for real appreciation in one's endeavour to describe the pleasure, the delight, and amusement, in the possession of one, however small. Many will say they are beautiful, no doubt, and suit large grounds and a full purse, little knowing that the erection of a wall garden and the planting thereof is one of the cheapest of all branches of gardening, and requiring less skill in their management afterwards.

Few there are who have not some odd corner in their garden, however small, where one could be erected, such as shady corners where nothing else succeeds, or the rubbish heap would be less conspicuous with a nicely-clad wall built around it; but enough, for it is not a matter of any particular site as to where it should or should not be erected. Single out that place or spot in your garden which is most displeasing to you and erect there a wall garden. You will be ever after pleased with it.

— How to Build. —

Commence first by taking out a trench one foot deep and from eighteen to twenty inches wide, the full length required. Procure plenty of large rough stones, and place on each side in the trench, taking care to leave a hollow of from six inches or more right through the centre, this hollow or cavity left to be well filled with soil as the work proceeds. Course after course may then be placed on both sides, with large stones stretching the full width of the wall placed at intervals between in order to bind the whole tightly together. No mortar whatsoever will be required, taking care, however, to work the soil firmly down throughout the centre. The stones should be so arranged as to have a downward inclination from both sides towards the centre. If so desired such a wall can be built slightly inwards from the perpendicular, if only by a few inches, by slightly drawing the stones from both sides inwards towards the centre as the desired height is reached. Take care to leave a margin between each side, even at the finish, so that the top may be utilised for various plants. The advantage is the means whereby the plants may obtain the full benefit of the rains by being carried right to their roots.

This method of building is called double building, and is superior to any other, offering in addition to a free and plentiful root run for the plants, the advantage of being easily constructed at a small expense, and requiring but little attention as to watering, etc., except during very dry periods, and last, but not least, having two aspects, thereby affording a means of growing under proper conditions the beautiful plants adapted for this kind of gardening.

Another method is to transform an existing wall into one for the accommodation of plants; with a stone wall it is less difficult than with a brick one. With these former it is often possible to pick out the mortar between the stones, leaving holes sufficiently large to insert soil for the plants to start in. Failing this, it is best to make pockets, which method is used on a brick wall. There are many and varied ways of making or forming these pockets, such as square, oblong, round, or various other shapes according as it is desired or the fancy suggests, the commonest being the square pocket. Procure some stout spikes from 9 to 12 inches in length; these may be driven into the wall between the bricks far enough to hold them securely, leaving from 6 to 9 inches on which to rest a slab, stone, or bricks. On the bottom thus formed place along the front stones or bricks, with one at each end. Connect the whole together and you have the pocket formed. The usual depth necessary is three to four inches, and any desired length; or if desired, small pockets of 4 to 6 inches square may be formed at intervals, according to the option of the interested party and in consideration for the plants intended to adorn the wall, some naturally requiring a little more root room than others. These pockets may then be filled with some good soil, and attention given to watering the plants growing therein during dry weather. Many of the beautiful plants which can be used to adorn a wall, may be grown from seed sown on the wall, or raised in boxes or beds and transferred to the wall whilst in a young growth, which latter method is preferable.

Autumn or early spring is the best time for planting a wall. When the plants are established little or no attention is needed, beyond keeping them within bounds, except during very dry weather, when a syringe or a watering from a hose, in the form of a spray, given once or twice a day will keep the whole in a beautifully fresh condition, and prevent injury to the growth or well-being of the plants. Among the many plants which flourish on walls mention may be made of a few such as Wallflowers, Antirrhiniums, Ferns, Aubrietias, Saxifrages (various), Helianthemums, Campanulas (dwarf), Sedums, Saponarias, Alyssums, Primroses, etc.

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Roses and Their Scent.

From "The Garden."

The Rose has formed the subject perhaps of more literature than any other flower; its history and cultivation have been so fully dealt with that it seems difficult to say anything fresh about it. But one, and that possibly the greatest of its charms, the scent, has of late been treated as a secondary quality to its colour, shape, habit of growth, etc.

George Herbert asked "What is fairer than a Rose; what is sweeter?" and some of our critics will have it that we latter-day rosarians pay most attention to the first question and neglect the second. This may be true in a way, but I rejoice to see indications that the perfume, the "soul of the Rose" as someone calls it, is getting more consideration. I notice in Mr. Molyneux's notes on the latest gold-medal Roses that they are fragrant. Moreover, in one of the earliest catalogues to reach me this season, I find the fact of a variety being fragrant is dwelt upon as though the fact was really a big item to its credit.

For many years I have taken considerable interest in the scents of Roses, and, indeed, from their perfume have tried to speculate upon their percentage, and if this has not been a very profitable pursuit it has given an added pleasure to my walks in the Rose garden, which to those who, like myself have grown Roses more years than we care to count is worth consideration.

There is no doubt that the scent associated with the Rose is the Old Cabbage or Provence perfume, found also in several old sorts of Roses, and no doubt this forms in a great degree the basis of the scent of our modern Roses. Most of our older red Roses possessed this scent in a greater or less degree, and I will mention a few of the sweetest old flowers that I can remember. Paul Ricaut (Hybrid Bourbon), Baronne Prevost, Senateur Vaisse, Alfred Colomb (Hybrid Perpetuals), and later, Ulrich Brunner and Hugh Dickson. I name these haphazard. Readers will, no doubt, think of many more perhaps sweeter.

But with the multiplication of sorts, whether chance seedlings or so-called pedigree Roses, the old scent became blended in a number of ways, and one could almost form groups of Roses which from their scent, as well as other characteristics of growth, seemed to have common origin. To take the Victor Verdier race as an example. All these, such as Comtesse d'Oxford, John Hopper and others, including S. M. Rodocanachi, have the same odour, reminding one of a hock or choice white wine; in that giant Paul Neyron, a sweeter perfume of the same character is to be found.

The Bourbon family seem to have a great range of scent, varying from the Malmaison type, in which I suspect the Musk, to Baronne Gonella, a very sweet Rose; Mme. I. Pereire and Zephyrin Drouhin, which, I think, is a Bourbon, perhaps one of the sweetest and latest flowers we have.

Among the Teas we have several groups: The Dijon family, with their delicate, refreshing perfume; almost as sweet are the Mermets, which I should call pure Teas; also Souvenir d'un Ami and its white sport. Mrs. Mawley has also a delicious odour.

To my mind the Watteville class, as Mme. Cusin and Golden Gate, are almost the sweetest, and Comtesse de Nadaillac has a delightful perfume of its own. Is it possible that some of the sweetest Bourbon blood is intermixed with this class?

I am afraid to tackle the Hybrid Teas, both from consideration to the reader and from the bewildering varieties of scent we meet in this charming class, ranging from La France to the delicate perfume of Bessie Brown. Here, with Captain Christy, we get another hint of the verdier type, and, alas! some of the scentless Roses. A very interesting group are the newer yellow Hybrid Teas. Mme. Ravary is very fragrant and Mme. H. Leuilliot has a strong apricot flavour, perhaps derived from the blend of Persian Yellow, which to some people is rather unpleasant in the original flower.

I must conclude this rambling paper, and will tell a true story rather apropos to my subject. Many years ago I was looking at a fine collection of Camellias, when the owner, an old lady, observed, "I think that really the best of Camellias is, that they don't smell." Long may it be before our Roses lose their scent!—J. T. Strange, in "The Garden."

◆

Peonies.

Florists have often said that any flower, to be popular and valuable, should be perfect in these five points: Beauty of form, beauty of color, fragrance, hardiness and adaptability as a cut flower, writes an American Horticultural Paper.

Think it over and see what flower will fill this list outside of the peony. The rose does, of course and perhaps the same is true of the lily. The gladiolus could fill the bill except for its lack of fragrance. In fact, the only flower that will fulfil all the conditions is the peony. It is the hardiest of all flowers, has a delicious fragrance, will keep for a week as a cut flower, and there is no other flower that will equal it in gorgeous color, beautiful form and immense size. It will grow and bloom for anyone and in any soil. It is cheap enough for the modest cottage to have a few choice clumps.

The peony has been called the flower for the million and the millionaire. The millionaire could have no finer flower, and no flower would do so well for the common average gardener.

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— Cultural Hints on Peonies. —

Peonies will grow in any soil that will grow potatoes or common garden stuff.

No special preparation of the soil is needed, but of course it should be well dug up, the same as for any kind of plants.

Rich soil is of course best, but it should not be filled with fresh rank manure. Old, rotten manure worked into the soil in small quanties would be all right.

Heavy soil is better than light. Thin, sandy soil is no good. If yours is that way, work in some black soil and clay.

Moist soil is best, but should not be wet, sour or soggy.

The roots should be set so that the crown or bud will be two or three inches under the ground.

Set the plants not less than three feet apart each way. They live twenty or thirty years, and need plenty of room. For large clumps four feet is none too far.

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The Rose Show.

Though somewhat handicapped by the fact that the date proved to have been fixed just a few days too early to catch the roses at their best, that two or three growers who are usually large exhibitors, stood down, owing, so we heard, to some difference of opinion as between the premier society and the Rose society in the matter of the appointment of the judges, and, finally, that the Town Hall not being available the Show had to be held at the Exhibition Building, which, no doubt, meant a considerable difference to the attendance, the event proved to be a pleasant and interesting gathering of flower lovers. The general attendance was not, of course, large; it never is, and until the Society can see its way to making the show more of a social function, by providing more music, more seating accommodation with afternoon tea thrown in, it probably never will be. Local interests and local rivalries, which are such important and effective factors in the success of suburban flower shows, do not operate to the same extent in what should be, but unfortunately is not, the largest and most important event of the floricultural year, a real red letter day in the flower world. The multiplication of societies has, no doubt, made for good in floriculture, but each has meant the withdrawal of some amount of support from the premier society, and to this extent, and this only, is to be regretted. Be that as it may, the visitor to the Exhibition Building on Thursday last had ample reason to be satisfied with his shilling's worth.

On entering the building the first item to attract one's notice was the remarkably fine collection, covering pot plants, palms, flowering shrubs, etc. In the various Pelargoniums—show, fancy, regal, and zonales—which, by the way, were not very effectively staged, Messrs. W. J. Smith, W. Pope and H. Sewell each contributed an excellent variety. In Azaleas Messrs. Newman & Son, and H. Sewell were the exhibitors. Mr. H. Sewell's double Petunias and Mr. W. Pope's exhibit of single varieties were both exceptionally fine. In the class for Orchids (three distinct) Mr. E. Baxter Cox had the satisfaction of staging the winning exhibit. The section alloted to Plants in Pots (without reference to bloom) including Ornamental Plants, Variegated Foliage Plants, Palms and Ferns, was one of the most interesting in the hall. Competition for the special prizes donated by Messrs. J. J. Duncan and W. Pope being excellent. Messrs. C. F. Newman & Son, H. Sewell, H. G. H. Piening, and W. J. Smith were each well represented and divided the awards. In this section, as indeed in some others, the naming of the various exhibits appeared to be more honoured in the breach than in observance. This is a matter of more importance than most flower show officials seem to recognise. For the few, i.e., the professional and the expert, the naming of entries is, of course, unnecessary, but failure to do so, wherever and whenever possible, robs any show of half its interest to the average visitor. In this particular instance we were able to assist a would-be buyer who was burrowing around in fruitless search for labels, to the names he wanted, but there is not the least doubt but that at every show many amateurs fail to get information which would be of very considerable service to them. It is surprising that nurserymen, in their own interest, are not more careful in respect to clear and prominent naming.

Coming to the Rose section, it must be admitted that the entries, in point of numbers were weak, and that the effect of the split in the floricultural camp was little short of disastrous. Any other course of action than that adopted by the Society, would, however, have been even more so, in establishing a most undesirable precedent. In the interest of rose growing and rose showing it is to be hoped that ere next year the trouble will be forgotten. For the last eight or ten years the prize lists in the rose section of this show have consisted largely of repetitions of the name of Kemp. This year is no exception, in fact it is rather more so than usual. Mr. Kemp's winnings are really a partnership affair, for though he, of course grows the roses, it is, we believe, to Mrs. Kemp that rose lovers are indebted for that artistic appreciation of the relative colour values which is the basis of the delightfully successful placing and arrangement of the individual blooms. This is no small factor in Mr. Kemp's practically invincible twenty-four's, eighteen's, etc. Not only are the blooms excellent individually, but there is a pleasing harmony of form and colour which is in itself a valuable object lesson in decorative work. Other winners in this section were Messrs. B. A. Hill, A. H. Scarfe, H. Eland, B. P. Mitchell (Rosebuds). This, we thought, was a disappointing class, too much bunching of the separate stands, too many to the bunch and the flowers themselves were for the most part, of the miniature type, Cecile Brunner, Mdme, Levasseur, etc. Mrs. Babbage and Mr. W. H. Ind (Bowl of Roses) both exhibits too crowded for effective display and Mr. W. Pope, who put up some particularly nice blooms in six and three classes for amateurs not exhibiting in the open class. The Champion Ribbon for Tea or Hybrid Tea went to Mr. Kemp for a delightful cut of C. J. Grahame, an excellent variety which most visitors not already growing it, no doubt put on their list for next year's planting. Other varieties which were well represented in this section were Countess Icy Hardegg, and J. B. Clark—there were lovely cuts of these in Mr. Kemp's twenty-four—Lady Illchester, Bessie Brown, Le Progress, Cynthia, Forde, Liberty, Mrs. Edward Mawley, Souvenir de Stella Gray, Belle Siebreicht, Ethel Brownlow, Betty, Farbin-konigen, Rev. T. C. Cole, and Mrs. David McKee. In the Hybrid Perpetuals the Ribbon also went to Mr. Kemp for a Prince Camille de Rohan, a good bloom but nothing exceptional. Other H. P.'s of which we noticed nice examples, were Commandant Felix Faure, Hugh Watson, Gustave Piganeau, Ulster, Duke of Connaught, Dr. Hogg, Fisher Holmes and Frau Karl Druschki, which, however, was not at her best. Of the decoratives Bardon Job was the most popular, an exceedingly useful rose, this, and one of the earliest to bloom.

Of the other cut flowers Poppies and Carnations stood out as easily the best collections. We do not remember to have seen at any previous Rose show such admirable displays of these beautiful blooms. Honours in Carnations certainly went to Mr. J. O. Lane, Warwick Street, Walkerville, whose wonderfully fine exhibits were quite one of the features and surprises of the show. Messrs. H. Munn and W. D. Robinson also deserved the warmest commendation for the excellence of their exhibit. Cleaner, brighter blooms than those staged by these three exhibitors could not be desired. Mr. Munn also had a supplementary exhibit of 48 not for competition which was greatly admired. In Poppies 12, 6 and 3, Mr. W. H. Ind was the only exhibitor, but we question whether a more perfect collection has ever been staged in Adelaide. Individually the blooms appeared to be flawless, whilst the exhibit, as a whole, was delightfully dainty and graceful. Same exhibitor won in Bowl of Poppies with Mr. W. Avid second. The weather has been too dry for Sweet Peas, which want rather more moisture in the atmosphere than they have been getting this spring. Mr. E. A. Lasscock, however, managed to put up a very charming collection. John Ingham was selected as the Champion bunch, but was run closely by Black Knight and Countess Spencer. Other varieties noticed were Primrose Spencer, Gladys Unwin, Mars, Black Michael, and Miss Wilmot. Mr. W. Pope won in six and three with nice quality blooms. Aquilegias were fairly numerous, Messrs. W. B. Robinson, W. Pope, and B. A. Hill doing the winning. The beauty of the Aquilegia, in its delicate colouring, is not seen at its best in the full glare of the sun, and the exhibits under notice were rather unfortunately placed in this respect. There were many excellent cuts, particularly, perhaps, a very fine shade of sulphur yellow, a cream and a beautiful blue. Mr. B. A. Hill is to be congratulated on his exceedingly fine and well staged exhibits in the classes for 24, 18, 12, 6 and 3 Annuals, special prizes being donated by Mrs. E. W. Hackett. That Mr. Hill did his winning unopposed does not detract for its merit. Cut Pelargoniums, especially single Zonale, were very fine, Messrs. W. H. Ind and W. Pope putting up some perfect trusses. In the Unenumerated which is a class which certainly deserves encouragement, some cuts of Waratah and Feather Hyacinth came in for most attention.

In the section including Bouquets, Designs, etc., we noticed some particularly charming work. The Floral Epergne by Mr. W. H. Ind was a delightful effect in Begonias and Fern, with just a suggestion of Forget-me-not. Same exhibitor's Design of Flowers and Fruit was perhaps the most beautiful single exhibit in the building, the delicate tints of the Poppies, the soft tone of the Begonias, the softening touch of delicate fern, were delightfully emphasised by the note of rich colour in the strawberries. In one of the Bridal Bouquets Carnations, Azaleas, and liles of the valley were used with excellent effect, whilst a Ladies' Dress Bouquet by Mrs. Babbage, in which Cyclamen were admirably treated, found special favour with many visitors. It was somewhat disappointing to find that the liberal prizes offered in the Decorated Tables only brought out only two entries. First prize was awarded to Mrs. Babbage for a well thought out scheme in red and pink miniature roses with maidenhair fern. The design appeared to us excellent in conception and faultless in workmanship, and it was certainly a matter for regret that, as the day wore on, the roses opened and spread, and what, when the judges gave their verdict, was a sprightly delicate design, lost more than half its charm by the flattening effect of the fully blown flowers. By evening, probably, the second table by Miss Isabel Hague, which was an effective scheme in dainty Aquilegias, would be more generally preferred. In this exhibit it occurred to us that a better distribution of the fruit (strawberries) might have been made. In fruit Mr. W. H. Ind had a fine collection of citrus, ranging from giant Shaddocks to diminutive Mandarins.

The Vegetable section is one which should receive more support than it does. Possibly a different classification might have this effect. Best collection of Vegetables calls to mind the mammoth displays of some of the hills gardeners at the September shows, and naturally this has a depressing effect on the ordinary suburban amateur gardener, who would, we think, be much more likely to face a class for, say, best half bushel of potatoes, or peas, than go the whole collective hog. Even if it is not practicable to classify vegetables singly, some subdivision should be possible, such as Root Vegetables, Green Vegetables, Salads, Herbs, and limit any exhibitor to, say, three or four sorts. This year Messrs. T. B. Robson & Sons put up two appetizing bundles of Asparagus, just to show how it should be grown. Rhubarb—rather a queer subject to select for one of the two distinct classes, we thought—did not attract an entry, or if it did we failed to see it. Mr. W. Pope was the only competitor in class for Best Collection. Mr. Pope put up an excellent assortment, including examples of most seasonable stuff. As for quality, well, it was excellent, too—for North Adelaide, which is doubtless a charming suburb though it must be confessed that its soil is for the most part a heart breaking medium for the growth of vegetables. We speak feelingly and from long ago experience.

To the President (Mr. Loutit), the Secretary (Mr. A. H. Scarfe), the Committee, and last, but not least, the Judges, who all contributed their share to the success of the Show, the thanks and congratulations of all lovers of the garden are due.

◆

Garden Shrubs.

The Weigela (syn Diervillea) is one of the most handsome of garden shrubs. It is deciduous and the fine clusters of tube shaped flowers open before the foliage expands. They are hardy enough but should be planted in a somewhat shaded position. The most commonly grown varieties are D candida, a pure white flowered sort and D. rosea, of a rich rose shade. D. Coceinea is a red and a variety named Jean Mace bears flowers of a very dark crimson. In height the Diervilleas may be classed as amongst the medium growers as they seldom exceed six feet. The foliage is handsome and a decided addition to the beauty of the plant. They grow somewhat easily from cuttings or layers..

— The Mock Orange. —

The Philadelphus or Mock Orange as it is called from its considerable resemblance to the blossoms of the Orange tree, is a very handsome shrub, bearing sweetly scented white flowers in small clusters with brilliant orange stamens. It is hardy and requires no particular care doing well in any ordinary garden soil which is reasonably drained. There are several varieties, all of which make shapely shrubs, growing to a height of five or six feet, and therefore suitable for small gardens. After flowering they should be cut back moderately hard to encourage the growth of new wood upon which the bloom of the following season will be carried. They are easily propagated by cuttings or by layers.

◆

Attention is directed to the advertisement of Mr. T. Sheppard, the well-known watchmaker, on page 281 of this issue, wherein he makes the special offer, that to any who mention the name of this paper when ordering one of his popular "Sheppo" watches he will send either of the presents enumerated in the announcement.

The Rose Garden.

— Roses and Manure. —

Nearly all amateur rosarians read in the different catalogues, etc., "that Roses are gross feeders and require a large quantity of manure." It is quite true that Roses do want a rich soil, but it is a serious mistake, especially in heavy soils, to apply these annual heavy dressings of stable manure or farm yard manure. Do these gardeners ever realise what a dressing of soot would do for a heavy soil, or, say, nitrate of soda for light soils?

Cow or pig manure is grand stuff, so also is stable manure, but do let us use them properly. Speaking generally, the best of these is, undoubtedly, farmyard manure, as it supplies almost all that is necessary for the growth of Rose trees. In soils that are not too heavy, cow or pig manure is quite the best; it is so much cooler for the roots, and also is much more lasting than stable manure. In very heavy, cold, clayey soils, the latter is the best, and a very good plan is to mix a lot of leaf-mould with it where one wants to lighten the soil and keep it as open as possible.

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Roses do not like damp, it is one of their greatest enemies. Mulching with manure during winter retains moisture around their collars, their most vulnerable part, and in a wet winter or a wet spring this mass of rank manure round them is the worst possible thing. Again, the heat of it hurries them on too soon in the spring, only to be cut back by the cold east winds. And further than that, when spring comes all the goodness has been washed away from the roots with the rains, and it is no good away down in the subsoil.

Firstly, of course, Rose beds should be properly prepared, adding what the ground is most deficient in. What suits them best of all is a deep yellow greasy loam. Light soils should have this, if possible, added to them in addition to manure. Strong clay land should be broken down by adding cinder or wood ashes, lime rubble, chalk, sand and long stable manure. The soil should be dug or trenched 3 feet in depth, so if we want success we must prepare our beds at least 36 inches in depth. In the trenching, mix the manure (according to the character of the soil) like a sandwich, i.e., alternate layers of manure and soil. Beds, of course, should be prepared a month or two previous to planting so as to allow the soil to settle down properly. As an extra fertiliser, a good thing is to work in, say, the top foot, some bone-dust or quarter-inch bones. Given beds properly prepared in such a way, all that is necessary in future years is to fork in a very light top-dressing (at pruning time) of short, well-rotted manure. Prune first and manure after is a sound maxim.

What I wish to particularly emphasise in these notes is that a great thing is to keep Rose trees as dry as possible throughout the winter. This is quite as important as protection from frost. With the exception of bone manure, avoid all artificial fertilisers with newly-planted Roses. The following year and afterwards a small handful of soot may be dusted round each Rose, say, in spring and autumn, or any of the other artificial manures, mixing the same with the surface soil by means of a fork, or liquid manure may be used through the blooming season, not more often than once a week, by mixing three parts cow manure, one part soot and one part guano thoroughly in a tank or tub with water, only using it weak, especially the first applications. Never even then use it stronger than when the colour of pale ale, and mind in dry weather, before applying, first to water well artificially. The best time to give liquid manure is after rain.—"The Garden."

◆

A Rose That Changes Colour.

The Chinese, Japanese, and Siamese are said to be peculiarly skilful at botanical feats, the most wonderful achievement of which is known as the "changeable Rose." The bloom of this unique effort, says an English paper, is white in the shade and red in the sunlight. After nightfall or in a dark room this curiosity of the Rose family is a pure waxy-white blossom. When transferred to the open air, the transformation immediately takes place, the time of the entire change of the flower from white to red depending on the degree of sunlight and warmth. First the petals take on a kind of washed or faded blue colour, and rapidly change to a faint blush of pink. The pink gradually deepens in hue until one finds that the Lily-white of an hour before is as red as the reddest Paeony that ever bloomed.

◆

Spent Hops for Roses.

A correspondent to "The Garden" gives the following interesting account of his experience amongst roses when using spent hops as manure. In the month of May, and again in July, he gave the whole of his plants a liberal top-dressing—this, in England. In addition to promoting the growth of the plants, it was found that this vegetable fertiliser had a strong tendency to deepen the colour of the flowers, and to render them more double. When a blush rose becomes pink, a pink one carmine, and a carmine one crimson, the change is very noticeable. Clio, being, as hitherto a tinted rose with a slightly flushed centre, brightened into an exquisite shell-pink, the inner petals several shades deeper; climbing Captain Christy underwent a similar development. Madame Victor Verdier deepened from plain red to glowing crimson scarlet, while the dark Prince Camille de Rohan became almost black. In most cases a great improvement was effected, but here and there a rose was spoilt. For instance, Madame

Gabriel Luizet assumed a mottled and flushed complexion, while Blairii No. 2 lost its beautiful carmine centre altogether. The most remarkable thing of all was when the vigorous climber Noella Nabonnand, invariably described in the catalogues as semi-double, threw out a fine crop of gorgeous crimson flowers of the shade we always associate with red velvet. The previous year this plant only gave cherry-coloured blossoms, consisting of three rows of petals, and much pleasure and surprise was felt at the transformation which had been brought about by a few handfuls of hop manure.—Exchange.

◆

Rose Perfume.

Each year tons of roses are wasted, and in this practical age ne thinks we ought to be able o save a little of their perfume. he rose contains the most favourte perfume of the world; its etals yield what is known as the ttar of roses. The perfume is repared largely in Turkey in urope, especially in the Balkan ountains, in Egypt, Persia, Inia, and other Eastern countries. n the south of France it is preared by distilling the petals of he rose with water; in Maceonia, by crushing the petals in ills, expressing the fluid part, ltering and exposing to the sun glass vessels; in Damascus and ther parts of Asia Minor, by dry istillation. It is stated that 200 s. of rose petals will produce one unce of the attar of roses. This nnot be bought, if pure, for less an £5 per ounce. It is largely dulterated with spermaceti, and everal volatile oils. Attar of roses ntains two oils, a liquid and ncrete. The petals may be faded d wilted, but the perfume of the se still lingers. It is stated that ses grown on light soil excel in e production of perfume.

◆

Watering.

Watering is one of the most imrtant details in the successful ltivation of all kinds of plants, ys "S.L.," in the "Journal of rticulture." All plants contain large percentage of water in ir composition. Every gardener ows quite well that if a plant is t watered during its growing iod it dies; but it is not so ll known why water is given to nts, both to the roots and also in the atmosphere surrounding them. In the first place, water is applied to the soil containing the roots to render the food materials in the soil soluble, to be readily taken up by the minute root-hairs situated just behind the growing points. Secondly, water in the form of vapour in the atmosphere prevents a too rapid transpiration through the leaves. Dry, hot air excites transpiration, whereas moist air checks it. Plants naturally adapted for growing in dry situations vary in their structure to prevent a too rapid transpiration. Some have thick fleshy leaves; others have their leaves so situated as to present as small a surface as possible to the sun's rays. Plants growing in a naturally moist situation have a large leaf surface. The foregoing external appearances of plants are of great assistance to cultivators in enabling them to select the most likely position in which to grow each particular subject. Too much water in a soil causes it to be cold; this is one of the chief reasons for draining land. Stagnant water is detrimental; it prevents the access of air to the roots; also, it is only when water is constantly moving in the soil that it acts upon the ingredients. Water rises through the soil by capillarity; and the finer the particles the greater the capillary attraction. The importance of a mulch lies in the power it has of retaining the moisture after it is drawn to the surface in this manner.

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The Action of Nitrate of Soda on Garden Soils.

In regard to the action of nitrate of soda on garden soils A. D. Hall, Director of the Rothamsted Experiment Station, England, writes:—

"One of the most characteristic effects of nitrate of soda as a manure, either repeatedly or in any quantity, is its deleterious action upon the texture of heavy soil; farmers have repeatedly observed that where nitrate of soda has been applied the land remains very wet and poaches badly if it is at all disturbed before it has dried. Market gardeners in particular have found this destruction of the tilth a serious drawback to its use. Some of the Rothamsted plots in the mangold fields, where very large amounts of nitrate of soda have been applied year after year for the last fifty years, show this deterioration of tilth in very marked fashion, the land being intolerably sticky after rain and drying into hard intractable clods, so much so that it is very difficult to secure a growth of roots unless the season is favorable." On the lighter soils, where leaching is more extensive, there is not the opportunity for accumulation of the sodium carbonate to such an extent as to seriously affect crops as a poison, or to injure the texture of the soil.

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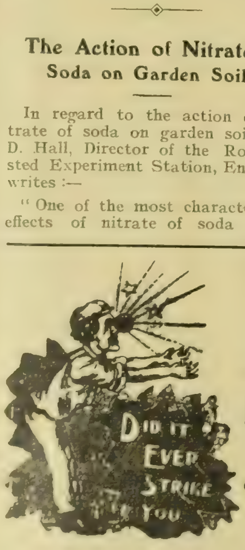
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Gentiana and Various.

Reply to "Ajax":—The gentiana is a superb edging plant for the cooler districts. There is probably no richer blue amongst all our flowers. They like a deep and rich but light soil. It is a low growing perennial—about a foot high—and may be sown now. Prepare a seed box in the usual way, taking special care that it is well drained. Sow the seed thinly, firm the soil and sift over the box a layer of fine stuff which will not cake. There is nothing better than a mixture of sand, leaf mould and very old manure, for it keeps the surface moist and the tiny plants have no difficulty in pushing through it. A third of an inch will be ample depth of covering. A sheet of glass over the box will hasten germination but this must be removed as soon as the seedlings show, when they do, use a light calico shade raised some distance above the box during the hot hours of the day and keep the box in a moderately shaded position. When the plants are big enough to handle prick out into beds or boxes three inches apart. Keep them growing—a fine mulch over the surface will help this along, and when the plants cover the surface plant out in permanent positions.

— Martynias. —

These very beautiful annuals are of the half hardy class. They are very distinct, the flowers, which in M. fragrans are purplish red veined with yellow and in M. proboscidea, a dark pink, are followed by a curiously hook shaped seed pod. The flowers are sweetly scented and well worth growing. Seed can be sown now.

— Tradescantia. —

The Tradescantias are rather dwarf growing, narrow leaved plants, bearing blue, white, or rose coloured flowers, useful for bordering and small bed work. T. zebrina makes a good basket plant. You can grow it from seed.

— Spirea Grandiflora. —

This is one of the finest of the Spireas. It is deciduous, grows about five feet high and the large white flowers are produced very freely. Can be propagated by cuttings or by divisions from the root.

— Diosma Alba. —

Is a very commonly grown compact little evergreen shrub. Will grow anywhere. The tiny white flowers are insignificant in themselves but make up for this by covering the whole bush, the scented foliage and habit of the plant are both excellent. Three or four feet is about its usual size. It stands cutting into almost any shape and makes a good low border hedge. Grows freely from cuttings.

— Choisya Ternata. —

This is another very desirable shrub to have. The leaves are of a rich glossy green, the flowers are white and very sweetly scented. Blooms in summer.

— Genistafragrans. —

This is one of the smaller growing "brooms" and a good thing to have. It is very free flowering and the yellow bloom is pleasantly fragrant.

— Deutzia. —

The Deutzias are very handsome. D. crenata fl. pl. is a fine double white with a tinge of pink. The Deutzias are deciduous. Grow easily from cuttings. It is in bloom now.

— Plumbago. —

P. capensis is a very common but very beautiful flowering shrub. You no doubt know the pale blue flower which is produced so abundantly. Grows from cuttings or from divisions of root stem. Is coming into flower now. Blooms for months.

— Garrya Elliptica. —

This is the Californian catkin and makes a fine show in the shrubbery, especially when laden with its graceful green catkins. As it grows up to 10 to 15 feet high it should be placed at the back of the shrubbery.

— Pavonia Coccinea. —

This is one of the medium sized evergreen shrubs. It is a native of Peru and does best in a warm and sheltered position. Its rather peculiar shaped flowers are produced abundantly in winter and early spring. It does not usually grow more than 4 or 5ft. high.

— The Buddleas. —

The Buddleas are a hardy, handsome tribe of evergreen shrubs, ranging from medium to large. In B. pulchella the flowers are small but very numerous and fragrant, and produced in winter. In B. veitchiana, which is perhaps the best, they are of a lilac shade, also in B. Lindleyana, all of which are suitable for small gardens. B. globosa and B. Madagascariensis are orange flowered. They are of larger size and quicker growth than the first mentioned. There is also a white flowered variety.

— Chilianthus disiphyllus. —

Chilianthus disiphyllus is a strong quick growing shrub, a native of South Africa and carries its white blooms very freely during the winter.

— The Chimonanthus. —

The commonly grown variety is C. fragrans, sometimes called the Japanese Allspice Tree. It is really a deciduous shrub growing from 6 to 10ft. high and especially valuable because of its blooming during winter and for the delicious fragrance of its yellow and red flowers. Chimonanthus ramiflorous, known as the Snowdrop, or Fringe tree, is a native of Queensland. It is an evergreen and when laden with its white bloom presents a very handsome appearance. When fully developed it attains a height of 30ft. C. virginia is a native of North America, where it is largely grown as an ornamental tree under the name of Fringe tree. C. retusus, the Chinese Fringe tree, is perhaps the most beautiful of the family. Its pure white blossoms are produced from all the auxiliary and terminal buds of the preceding year's wood and the petals are upwards of an inch long. The flowers are borne in great abundance so that the half-opened leaves are partially hidden. The bark is of a rather peculiar red brown colour and in specimens of some years' growth hangs around the wood of the older and lower parts of the plant.

— The Judas Tree. —

This is Cercis siliquastrum, a very handsome addition to the shrubbery. Its somewhat unusual colouring makes it a conspicuous object wherever grown. The colour is a little difficult to describe, deep flesh colour with a purple mauve tinge is fairly near it. A good point about this shrub, it is deciduous by the way, is that the small tufts of flowers develop each year on old and new wood, covering the whole tree for some weeks during August and September. It is of graceful willowy habit, and may be grown up to 12 or 20ft. C. Japonica is a smaller variety, there is another variety, C. Canadensis, but this is not, we believe, grown here.

You can procure any of the above in pots from either of the nurseries. You can put out any pot grown stuff now or at any time, even in summer, if you take sufficient care. If the weather becomes very hot after planting shade with inverted kero or similar box, open on south side, till they are established. Get small healthy plants rather than larger ones. Keep a mulch over the roots and don't forget to water. The shrubs you mention are all good even though we may not agree with your adviser that they are the best, even supposing that there is such a thing as a best selection in garden work, for so much depends on individual taste and suitability for whatever purpose the plants may be required for.

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The Achimenes.

Amongst the many useful pot plants for the green house, the genus of Achimenes may be classed as in the front rank of really beautiful subjects for conservatory decoration during the summer and autumn months. There are a number of species of these exquisitely lovely herbaceous plants, and all are natives of Central America and the West Indies.

Achimenes are generally treated as hot house plants, but they may also be grown in a green house, or frame, during the summer months, though treated to artificial heat they will develop into stronger plants, and produce finer flowers. Their propagation is easy. The plants have curious scaly tubers, and each one of these scales, when separated, is capable of forming a new plant. They may be increased by seed and by cuttings, and also by taking off the mature leaves, inserting the footstalks in sand, covering them with a bell-glass, and placing them in bottom heat, in the same manner as Gloxinias may be propagated.

A light, rich soil is required to grow these plants to perfection. An excellent compost may be made by using equal parts of turfy loam, fibrous peat, and leaf mould, or in the absence of the latter, well decayed cow manure may be used. To keep the compost open, a good proportion of sand should be used, and if some small pieces of charcoal are mixed with it, so much the better. Thorough drainage is of the greatest importance, and should be about one-third the depth of the pots, placing a layer of charcoal over the crocks. Several tubers should be placed in one pot, and they should be covered with about half an inch of soil. The plants do not make any large roots. A fine effect may be made by growing these plants in deep seed pans. They are also grown in hanging baskets, like orchids or some of the ferns.

Achimenes will not stand exposure to hot sun—shade is essential at all stages of growth. A moist atmosphere is better than a dry one. In the early stages the plants do well in a gentle hot bed. As they advance into bloom a little liquid manure may be given now and again, and even when only a few inches in height the plants are benefited by mulching them with a little rotten manure. When in the autumn the plants die down, water must be gradually withheld, and, when dormant, the pots, with the tubers in them, should be laid on their sides in a warm, dry place.

Besides the species, there are numerous varieties of Achimenes. They are of many colours, purple, white, crimson, violet, rose, scarlet, lilac, etc., and nearly the whole of them are worth cultivation.

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Lilies in Pots.

A point to be borne in mind is that Lilies are divided into two groups, namely, varieties that root from the base of the bulb only, and those that emit roots from the stem just above the bulb as well as from below. Bulbs of the former type may be potted in the usual way, but those belonging to the latter class must either be potted low down in deep pots or be repotted as the stem roots are produced, an excellent compost for pot Lilies being four parts turfy loam, two parts fibrous peat, one part dried decayed cow manure, and one part leaf-mould, a little coarse sand or road grit also being advisable if the peat contains very little sand.

Six or seven inch pots are usually large enough for one bulb, whilst a twelve inch pot will accommodate three or four bulbs. Well drain the pots with crocks and a layer of rough compost or fairly fresh leaves, and place some coarse sand around the base of each bulb, and also around the crown, to prevent decay and assist rooting. The compost should be nicely moist so that water will not be required until growth commences, and it must not be made too firm either round or on top of the bulbs.

When growth has freely commenced the plants should be gradually hardened if they were started in a greenhouse. As soon as the stem roots are about half an inch in length, the bulbs must either be repotted or top-dressed, as the case may be, with rich compost of a rather lumpy nature. Until the pots are well filled with roots the bulbs require very little water, but when in full growth ample quantities should be given, together with occasional applications of weak liquid manure and artificial fertilisers, and to ensure sturdy healthy growth plenty of light, air and sunshine is essential.

When the plants have finished flowering, the seed pods should be cut off, and water be gradually withheld, and when the bulbs have been dried off, the pots should be laid on their sides. Liliums may be propagated by planting the offsets that are produced on the bulbs. These should be removed, and be planted in a pan of sandy soil, and in time they will develop into flowering bulbs. Scales detached from the bulbs may also be inserted in a pan of sandy soil, and these will produce useful flowering bulbs.

Farmers who are with good reason rejoicing in the splendid seasons that are prevailing should not forget the possible danger from fire. Just now, when the whole country side is clothed in a mantle of green, there is little to remind one of the scorching summer days that are to come, bringing with them the possibility of fires amongst the crops and rick-yards. To be forewarned is to be forearmed, and the sensible farmer who believes in leaving nothing to chance is reminded that the Liverpool and London and Globe Insurance Co. makes a specialty of hay and crop risks. Claims paid by this big company exceed the large sum of £55,000,000. The manager is Mr. T. M. Douglas, and agencies are established in the principal country towns. Besides haystacks and growing crops, all descriptions of insurance are undertaken at lowest current rates, Live Stock, Accident and Disease, Employers' Liability and Workmen's Compensation, Guarantee, Plate Glass, Burglary, Public Risks, etc. The chief office for S.A. is at 36, Grenfell St., Adelaide, where applications for agencies in various districts will be received.

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Gardening: Its Charm and Mystery.

It is the uncertainty and mystery about all gardening efforts that I think make this hobby so fascinating. There are some hobbies that are so fixed in their results that one practically knows the end from the beginning. Not so with gardening; man tills the soil and sows the seed, plants and prunes the trees, but the result is altogether in the dark.

Mark how the enthusiastic gardener, first thing in the morning goes down his garden and looks round (in growing time, of course) to see the result of the night's work, for night is a great growing time. The Rose exhibitor hurries in the morning to see if the particular Rose he hoped for is just fit, only to find it blown, and may be, before he has time to think about his regret, he finds one advanced enough of another variety to take its place, for which he had not dared to hope. Again, the rosarian has pruned a certain Rose bush in the spring, and looked for good results, but, to his chagrin, it sends up two good shoots, but both without a bud. He forgets that tree for the time being, and turns his attention elsewhere, and, some days later is astonished to find a good shoot coming right from the base of the bush; it comes up, and in course of time, a splendid bloom is his reward, most welcome because least expected.

A man buys seed of a certain flower, he sows it, it comes up much as hitherto, but he is surprised one day in the flowering season to find that amongst them are several beautiful strains of flower quite new to him, and may be to the world of gardening, a mystery he may understand if he will carefully study Nature. What could not be written of Orchids in this respect, roots bought sometimes for a mere trifle, and yet returning, through the medium of their unique blossoms, their purchase money a thousandfold?

It is the speculation entailed in gardening that makes it so fascinating a hobby; there is no certainty about it, but many surprises. It is to my mind the hobby of hobbies healthful, useful, interesting, and full of a glorious uncertainty that always keeps one on the tip toe of interested expectancy.

What gardener is there who has unfastened a bundle of new Rose trees in the autumn, and has not seen within that bundle hopes and great expectations for next summer? Or, again, another who orders a lot of herbaceous stuff for a new border, and not having grown them before, see how he criticises some of the ugly roots rather disdainfully. But, and I have experienced these things myself, it is this very dubiousness and uncertainty that adds such a piquancy to one's feelings when the results are seen? Some things may fail, but Nature is generally very bountiful, and exceeds in production and results our highest expectation. A mystery indeed, and therein lies the garden's charm.—" The Garden."

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Trustee and Executor Companies.

Each year the excellent work carried out by the Executor and Trustee Companies is being more widely recognised, and it almost seems as if the individual trustee before long would be an extinct species. Britons are notoriously conservative and averse to change, but, though the history of Executor and Trustee companies is a comparatively modern one, such institutions have been in existence sufficiently long enough to amply prove their worth, and the most sceptical opponents have come to see their obvious advantages. Perhaps the most effective testimony is the large number of clear headed business men and financiers, both in Australia and in the old land, who entrust the management and control of their estates to such institutions. Careful investigations have shown that the advantages of the public company—always provided, of course, that the same is under good management—as compared with the private individual, are almost invariably on the side of the former. The individual trustee, be he ever so suitable, may die before he is able to carry out his duties, and the management of the estate pass into the hands of an individual in whom the testator, in his lifetime, had no confidence, and whom he would under no circumstances have desired to administer his affairs. This, however, is not the only danger, for if the individual trustee does not die, he may, whilst being perfectly honest, be anything but a good business man, and as a result the estate be greatly depreciated. Then, though cases of fraud on the part of trustees may be said to be comparatively rare, such cases do occur, as sorrowing widows and orphans only too eloquently testify, and the prudent testator cannot be blamed for always having this possibility before him. From the point of view of the individual trustee there is also something to be said. His office is one of great responsibility, and very often a thankless one; indeed, many executors, whilst acting in good faith and with the best of intentions, have brought ruin on themselves because their judgment has unwittingly led them astray. So onerous, indeed, are the duties of an individual trustee, especially in the case of complicated estates, that it is surprising to find individuals prepared to shoulder such responsibilities. In the case of an institution such as Elder's Trustee and Executor Co., all these difficulties disappear, and the testator has the satisfaction of knowing that the disposition of his estate will be carried out precisely in accordance with his wishes. Further, that his executors, being a permanent company, managed by a Board of Directors of the highest probity, there is no fear of complications arising from the deaths of individuals, or losses arising from incompetency or fraud. As an off-shoot of the firm of Elder, Smith & Co., Ltd., the new company has started under the most favourable auspices, especially in view of the wide prevailing prosperity, and the prestige of the great firm which has done so much for South Australia cannot fail to be of advantage to and be reflected in, the new Company. The Board comprises such well known names as:—T. E. Barr Smith, T. L. Browne, Wm. Taylor, G. H. Prosser, A. J. Murray, and Peter Waite, with Mr. A. S. Chapman as Secretary. For fuller particulars we direct the attention of our readers to the Company's advertisement in another column.

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The Orchard.

Notes for November.

The season promises to an be an xtra good one for fruit. Possibly omething may happen but the robability, at all events is, that eaches and apricots, at least, will e very abundant. It this should rove to be the case it will be nore than usually necessary for he man with fruit to sell, even n a small scale, to have a first ass sample to offer, whilst for e amateur it is always a waste time to grow dirty, small, un- viting stuff, if for no other rea- n than that he can buy it as eaply and with much less trouble an he can grow it and use the ace the trees take up for some- ing more remunerative. The ower has, of course, no control er the weather, but he can con- lerably influence the quality of crop and the condition in ich it is marketed is almost al- gether a matter within his own trol. Quality and condition are ays important, but more so n ever when an extra plentiful ply may mean a difficulty in ting payable prices for anything n slightly inferior, for it must remembered that whilst there lways someone who wants the best and is willing to pay for it, the next grade meets greatly extended competition. With such prospects as are now before us the importance of spraying, thorough cultivation, watering where practicable, thinning and care in picking, packing and marketing is very apparent. With regard to fungus diseases in pip fruits, also shothole and scab in stone fruits, curl, freckle, rust, etc., in peaches, Bordeaux Mixture is the recognized treatment. This is, however, a preventive rather than a cure and should be so regarded. For thoroughly satisfactory results the application must be made before the blossom falls. In the case of curl leaf, which is the worst, or at all events, most apparent disease of the peach; opinions differ as to the utility or otherwise of late spraying, i.e., after the leaves unfold, still, as a second application is recommended—after the fruit has set—for other diseases of the peach, which may be present though not recognized, as well as for scab and rust in stone fruits, it will probably be good policy to try its efficacy in preventing the spread of the disease in those varieties, and in districts which are not yet far advanced. If such spraying does not do much good as regards the curl, one may be certain that it will do no harm but rather the reverse to the tree and the crop. To the man who is now confronted with scorched, disfigured trees and who is with good cause wishing that he had learnt to spray, the lesson is obvious and should be taken to heart, viz., that the only sure method of prevention is to spray early and to spray thoroughly. Another trouble for the peach grower will be found in the aphis, for this pest kerosene emulsion or resin wash must be used whenever they appear.

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Codlin Moth.

The codlin moth will now be contributing its share in keeping the apple and pear grower busy. It is recognised that the price of a high percentage of clean fruit is spraying, and generally speaking, that price is being paid. The routine of spraying with Arsenate of Lead is practically the same wherever apples are grown in the Commonwealth. The first spraying [illegible] while the eye of the fruit is still open, this will vary according to variety of fruit and season. The second from 15 to 25 days later. Further sprayings depending on local conditions.

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Okra.

— Hibiscus Esculentus. —

This is another plant which should find a place in the amateur's garden, who is on the look out for something useful and a little out of the common. It is not a crop one wants to grow largely for its uses are limited to flavouring soups and stews, providing a substitute for green peas (it hardly lives up to its mission in this respect) and for salad purposes.

Like Rosella, to which it is botanically related, it is an annual plant and a native of warm countries. In habit and general appearance and flower it rather resembles the cotton plant, another member of the same family, on a larger and coarser scale. Okra comes to maturity quickly and continues to bear the pods which are the edible part of the plant for a considerable time. The seed germinates readily and may either be sown in a drill or in clumps of three or four. Seed should be well covered, not less than an inch, and the soil around the growing seedlings should be kept well stirred. The plants will grow well in a variety of soils but a strong loam which is rich in plant food will give the best results. When once the plants commence to flower the formation of the pods takes place with very great rapidity. It is necessary to gather frequently both because the flavour of the young pod is much superior to one in which the seeds have ripened and also in order to secure continuous bearing. The pods should be used shortly after gathering or they may be dried for winter use. It should be mentioned that okra, or gumbo, as it is sometimes called has a somewhat peculiar and distinct flavour and it is quite possible to dislike it rather badly.

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Citrus Manuring.

The kind and quantity of fertilizer required to produce a heavy crop of oranges must necessarily vary, depending to some considerable extent on the original composition of the soil. Naturally fertile land provided it is of suitable physical condition, will produce trees of vigorous growth which usually bear large crops of fruit for a great number of years, but the possibilities of such trees, unless the stores of plant food are supplemented by the application of manures, are necessarily limited to what Nature can do. The problem of manuring on an economical basis in such cases is undoubtedly a complicated one. In soils naturally deficient in one or more of the principal plant foods the question of manuring to obtain maximum crops is probably somewhat simplified, whilst in very poor, sterile land the quality of the fruit and crop production are no doubt more completely under the control of the grower and it is upon such soils that some of the heaviest crops and of the very finest quality are produced. In an article in U.S.A. Farmers' Bulletin, 239, "Citrus Fruit Growing," quoting from a European source, the question of "poor land" manuring is discussed. Some of the suggestions made and the opportunity afforded for comparison with Australian practice will, we think, be of interest to our citrus-growing readers.

The following is the extract :—

It is calculated that a hectare approximately 2½ acres, of oranges containing about 250 trees and yielding, when in full bearing, 66,000 pounds of fruit, would remove from the soil 250 pounds of nitrogen, 284 pounds of phosphoric acid, and 250 pounds of potash. If these elements are returned to the soil the equivalent of 1,672 pounds of nitrate soda, 1,544 pounds of superphosphate of lime, and 495 pounds of sulphate of potash will be required. This formula is intended for soils composed mainly of siliceous sand, with some lime and clay, having a good depth and capable during the summer of receiving copious irrigation. This is considered by the author the ideal soil for oranges. On other soils this formula cannot be strictly adhered to.

The evil effects attributed to an excess of nitrogen are that it produces an exuberant growth of wood and foliage, while the resulting fruit is very coarse and thick skinned, with little sugar or aroma and of bad keeping quality. The time of ripening is also retarded. With an excess of phosphoric acid the fruits are small, numerous, well flavored, and aromatic, with thin skin and poor pulp. "When potash is superabundant the tree does not grow very large, but the fruit is juicy, sweet, and of pleasant flavour."

As to the most desirable forms of fertilisers the author prefers sulphate of ammonia in light soils and in those charged with organic matter. Nitrate of soda is better applied to heavy soils. Superphosphate of lime is considered the best of the phosphate fertilisers. "Only in gypseous soils and those humid and rich in organic residue should the 'Thomas' phosphate be employed." The sulphate and chlorid of potash may be used indifferently, though the sulphate appears to give more delicacy and fragrance to the fruit. In rather limy soils the use of sulphate of iron is considered beneficial. In those with a little lime, and especially if inclined to be rough and clayey, the use of gypsum is advised.

In fertilizing young trees materials furnishing about one-half the nitrogen and phosphoric acid and one-fourth the potash required for an orchard in full bearing, as noted above, are required. For old trees the following is one formula recommended : Sulphate of Ammonia, 660 pounds ; nitrate of soda, 880 pounds : superphosphate of lime and manganese, 1,760 pounds ; sulphate of iron, 660 pounds ; chlorid of potassium, 55 pounds, per hectare. In the case of orange trees which produce an abundance of wood, leaf, and flowers, with but little fruit, the author believes the defect due either to a deficiency of nutrition or to a deficiency of the phosphates which promote the fecundation of the ovary of the flower, or to a superabundance of nitrogen, "which by excessively expanding the sexual organs of the flower produces its abortion." The following formula is suggested for such trees : Sulphate of ammonia, 165 pounds ; nitrate of soda, 165 pounds ; superphosphate of lime, 2,300 pounds ; kainit, 660 pounds ; sulphate of lime, 660 pounds, per hectare. With orange trees suffering from gumming, the use of organic fertilisers, and especially horse manure, should be avoided. The only manure required for trees in the seed bed is the free use of horse manure.

The effect of fertilising orange trees in the very poor thin soils of Florida with different ingredients has been very thoroughly discussed ine one of the Year books of the U.S.A. Department of Agriculture. The closing paragraphs of this article are as follows :—

Summarizing, it may be said :—

(1) By a proper combination of the various elements used in fertilization one can undoubtedly largely govern the quality and flavor of the fruit.

(2) To obtain a fruit with thin rind, use nitrogen from inorganic sources in moderate quantities, with considerable potash and lime.

(3) To sweeten the fruit, use sulphate of ammonia in considerable abundance, decreasing the amount of potash.

(4) To render the fruit more acid, increase the amount of potash and use nitrogen from organic sources.

(5) If it is desired to increase the size of the fruit, as is sometimes the case, apply a comparatively heavy dressing of nitrogen in some organic form and slightly decrease the other elements. In the case of the tangerine and mandarin, where a larger size is usually desired, a heavy dressing of nitrogen fertilizers would favor this end, and is not objectionable unless carried to excess.

(6) Fertilization has an important bearing on diseases.

(7) Die back, a serious malady, is in all probability the result of overfeeding with nitrogenous manures from organic sources. These manures if used at all should be applied with great caution.

(8) Foot-rot, although not primarily due to improper methods of fertilization, is no doubt considerably influenced by this cause.

(9) Insect diseases are also apparently influenced by the use of fertilizers, organic manures rendering the trees more liable to injury from this source than chemical fertilizers.

The Value of Apples.

Apples are now held to contain much sustenance for the brain and to have an exhilarating effect on the spirits. Apples contain phosphorous and also malic acid, which are most beneficial for people under mental strain or who habitually do work which prohibits exercise. The apple should not b munched between times, but taken as a component part of the regular meals.

Propping the Tree.

Though modern methods of pruning have very considerably reduced the need for propping as a general practice, the following article from "The Fruit Grower" may be helpful :—

It is very necessary in orchards which are carrying heavy crops, to support the branches with props to keep them from being broken down by the weight of the ripening fruit. There are several ways in which this can be done. The one which will be described here is the most economical of any method in use at the present time.

The materials needed for one tree consists of (1) one strong, solid pole ; (2) a quantity of 16-gauge galvanized wire ; (3) limb-preservers ; (4) one 18-penny nail ; (5) one piece of 2 x 8 timber, or a flat rock.

The pole to be used must be strong and solid, at least so long as two-thirds the height of the tree, and with a diameter of not less than three inches. The pole must be of strong wood, and good throughout its entire length, as it must bear the weight of the entire load, and for this reason the cheapest kind of poles are not the best.

The limb preservers consist of either leather or galvanized sheet iron, or of leather and wooden blocks. They can be made of scrap leather from the harness shop, or from old boots, shoes or even tin cans. Their purpose is to prevent the wire from cutting into the limb.

The 2 x 8 or flat rock is to serve as the foundation for the pole and prevent its sinking into the ground, and the nail is put into the top of the pole and serves in supporting the wires.

— Setting up the Pole. —

The board or flat rock is placed on the ground about two feet from the trunk of the tree and on the leeward side. From the nail in the top of the pole four wires are suspended, and the pole allowed to lean towards the windward side. Stretch each of the wires down to solid limbs, in such a manner as will best serve as braces for the pole, and hold it in position.

When the limb preservers are put on, be sure not to tie them around the limbs, but thread the wire through both holes and place them under the limbs ; fasten the ends of the wire about five or six inches above the limb, making a tie that will not slip, and yet support the limb, just as a child is supported by the board in a swing. As many additional wires can be put on as may be necessary, although two or more limbs can frequently be fastened to the same wire.

The cost of this method of propping trees will depend on the material used, and the size of the tree. On the average I believe 1/6 per tree will be plenty to establish and keep in proper form for ten years. This makes the annual expense only 2d. per tree.

One firm of growers put in such a system as this on their thirty acre orchard some four years ago, and it has worked very satisfactorily. Last year from this orchard was sold an average of 1,000 boxes and without a single breakdown in any of the trees.

This outfit stands winter and summer, the only changes that are needed from time to time, being to change the wires where necessary, and to put in more wires where they are needed. This method will not eliminate the necessity for proper pruning, but it will prevent serious breakdowns and save a whole lot of the crop and many a fruit tree from total destruction.

The active, thinking, progressive fruit grower will always watch his fruit trees closely, and try to work systematically. The summer pruning can be combined with the inspection of the propping and a look out kept for insects and diseases ; in this way three operations are done at the same time and the expense of production is consequently reduced.

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Plant Breeding by Bud Selection.

Though breeding from and for individual excellence by rigid selection based on performance, has been for years a very prominent feature in all stock breeding work, especially where product as in wool, milk, eggs, etc., is the objective, the orchardist has in the main failed to follow the same course in his endeavour to produce more and better apples, peaches, etc., though he has no doubt observed the marked difference in production in different trees of the same variety growing under similar conditions. It is of course true that the substitution of one tree or many trees for other and better ones is a matter of more difficulty than changing one cow or a herd of cows for more productive ones, but the fact that realization of improvement based on the keystone of all reproductive processes, viz., that like begets like, is not without difficulty, should not blind him to the possibilities which lie behind what may be simply summed up as variental selection. It is usual to speak of the orchardist's work as fruit growing, if we speak of it instead as fruit breeding, we get a better understanding of the full scope of his work. It may be objected that fruit breeding is more the work of the hybridist and nurseryman and in a measure, and in the stricter sense, this is correct, for the hybridist is undoubtedly the true plant breeder. Nevertheless after a variety has left his hands, there is plenty of room for the working orchardist in fruit improvement. The hybridist tests and rejects immense numbers of plants before putting out an improved or perfect variety. On the same principle the orchardist should keep on rejecting for propagating purposes in any shape or form, anything which falls short of the highest possible standard. In other words it is the province of the hybridist to select till he arrives at a perfect type, that of the orchardist to select for individual perfection. In one sense the work of the fruit breeder is more simple than that of the animal breeder inasmuch as in budding and grafting it is part of one selected individual which carries on the life process whereas in animal breeding it is the union of two distinct forces.

There are difficulties, no doubt, but is not progress of any sort the result of overcoming them ? In these days of rapid agricultural and horticultural development, it is natural to look to the experiment stations which have been established in practically all civilized countries for light and leading in any problem affecting the general welfare. Up to quite recently the work of horticultural stations has been largely confined to comparative work as between existing varieties, the breeding of new varieties and experimental and demonstration work in connection with the prevention and cure of tree and fruit diseases, in all of which, work of immense value to the working orchardist has been accomplished. During the last year or two there has been a rapidly growing recognition of the opening for profitable work by taking the individual tree instead of all trees of a variety as the true unite of comparison.

In this as in much other experimental work America is likely to take a leading part. We have be-

(Continued on page 256).

Cross Pollination in Fruit Production.

By H. G. Smith in Wisconsin Horticulture.

Fruit production depends upon sexuality. Sexuality signifies the presence of male and female elements. The union of the male and female elements or the transference of pollen to the pistil of the flower is pollination. Failure of pollination means failure in fruit production. There are many orchards where failure has resulted because of this fact, some of which have produced only three crops in twenty-five years. Now most flowers of any variety have both male and female organs. Consequently, you may immediately come to the conclusion that pollination must surely occur at all times. This is not the case. Two varieties based upon pollination exist. They are self sterile and self fertile varieties. A self sterile variety is one which is unable to fertilize its pistil with its own pollen, while a self fertile variety is one which is able to perform this function.

Self sterility and self fertility are not constant with any variety so far as known at present time. Conditions; such as, location, adaptation to soil and climate, and state of nourishment are important factors, any one or all of which may make a variety self sterile. Thus, Bartlett and Kieffer pears are often self-sterile, but there are orchards of both which are self-fertile. The same is true with many other varieties of fruits.

What then are the factors which have caused non-pollination. They are these: first, difference in time of maturity of stamens and pistils; second, disability due to structural conditions (that is, the pollen may be imperfect as with some vines, or the pistil may be malformed as is the case with certain varieties of plums); third, absence of stamens. As an example of this, take the strawberry. Those who are familiar with the strawberry well know that pistillate and staminate varieties must be planted alternately if a crop is to be expected from the pistillate sorts, and when this is done the most abundant crops are produced.

There is still another factor which applies to the three factors of non-pollination already named and also applies to flowers which are seemingly perfect. It is mutual affinity between the pollen and the pistil.

Lack of affinity and lack of simultaneous blooming periods are the two most important causes of self-sterility or lack of fruit production. There seem to be different degrees of mutual affinity between the pollinizer and the self-sterile variety. Self-sterile varieties demand cross-pollination also because of lack of affinity. Consequently the conclusion, lack of affinity demands cross-pollination.

Cross pollination demands:—Simultaneous blooming; affinity of varieties, proper conditions at blooming; and proper means of transference of pollen. Simultaneous blooming is essential, for the only way in which a pollenizer can make a self-sterile variety fruitful is by supplying it with pollen. If it is to supply it with pollen it means that the pistils of the self-sterile variety must be receptive when the stamens of the pollenizer are ripe, which is possible only with simultaneous blooming. The comparative blooming of varieties is more or less of a local problem, because of local conditions such as climate, altitude and environment. The blooming period may not only be hastened or retarded but the order in which different varieties bloom may be disturbed. The proper conditions at blooming can be best expressed negatively. Long, rainy, cold moist periods of three or four days are not desirable. The transference of pollen is a very important feature in pollination. The two factors which transfer pollen are the wind and insects. Many think that the wind is the more important of the two. This is not true as demonstrated at the Oregon experiment station. For example, only six pollen grains were found at the end of 24 hours on a glass slide one inch wide and three inches long placed twenty feet from the trunk of the blooming tree. Glass slides placed at different distances helped prove the

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above result. But more conclusive than this is the experiment with two apple trees comparing wind and insect pollination. Fifteen hundred blossoms on a seven year old tree were emasculated and only five set fruit. During the time the pistils remained receptive only eight bees visited the tree. More than twice that number were seen on the tree twenty feet distant in one-half hour. Is this not evidence enough to show that pollen is not transmitted through the air in sufficient quantities to insure cross pollination? The conclusion for every fruit grower should be, have an apiary or let the neighbors have one for his benefit.

I have mentioned thus far benefits of cross-pollination in self-sterile varieties. What are the benefits of cross-pollination in self-fertile varieties, if any? The experiments at the Oregon station are conclusive as to the results. In these experiments the self-fertile varieties, Spitzenberg and Newtown were used; Spitzenberg fruits resulting from self-pollination averaged only 100 grams; those resulting from cross-pollination by Newtown, 126 grams; Arkansas Black, 128 grams; Jonathan, 148 grams; and Baldwin, 157 grams. Newtown fruits resulting from self-pollination, averaged 73 grams; cross-pollenized ruits with Bellflower, 104 grams, Spitzenberg 147 grams, Jonathan 162 grams, and Grimes Golden, 172 grams. These results show that there is an increase in size due to cross-pollination due to mutual affinity, Grimes Golden being the most mutual to Newtown and Baldwin to Spitzenberg; and that the affinity of the pollen and the pistil of the same variety is far less than between different varieties. Self-fertile varieties then demand cross-pollination as well as self-fertile varieties. Darwin came to this conclusion in 1857 when he said, "Nature abhors perpetual self-pollination. It is an interesting fact to note that the seeds of the respective crosses varied and that the variation closely followed that of the fruits; that is, the rgest fruit usually contained the rgest seeds."

What is the practical application cross-pollination? Since self-erile and self-fertile varieties are th benefited by cross-pollination, ant several varieties. The Oregon station found for apples that alternate rows of trees of three different varieties were suitable, making chard management convenient, is being necessary for spraying d harvesting. Again, do not ant solid blocks. Some one may ve this question in mind. What varieties shall I plant? Experiment stations are just beginning the study of this question, thus enough evidence is not at hand to give definite answer. All that can be said is make use of what has been done so far as possible and then give careful attention to blooming periods of different varieties in your own neighbourhood. With strawberries a definite answer can be given. It is plant at least one male variety alternately with the pistillate variety.

From the discussion of the different factors to be considered in cross-pollination it is plainly evident that the problem is not a simple one, but one that needs study and skill when it is to become practically applied as well as when scientifically studied. Some one may say that the problem is too big for the orchardist; but it is the mastery of just such problems as this that has made the orchardist successful. The applying of the principles involved in cross-pollination will be just one more step in the direction of success in horticulture.

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Soils and Seed Sowing.

The finer the ground is cultivated the better it absorbs the water, says "J.J.W." in the English "Journal of Horticulture." Soil that is lumpy and full of clods presents less feeding surface to roots, and contains less capillary water than an equivalent amount of well-pulverised soil. This is illustrated by gardeners who are able to grow fine, healthy plants in a small flower pot by using only well pulverised and sifted soil. The same plant would require five or six times the amount of soil area if planted in the open garden, and then possibly not thrive so well.

Another property of soils is the capability of retaining moisture. It is lowest in sand and highest in peat. Sandy soils give off their moisture in one-third of the time of that of clay, loam, or leaf mould. The retentive power of soils is increased with the addition of organic matter, known as humus; hence the advisability of using rich leaf-mould for mixing when the soil is naturally poor in humus. Good digging of soil, by preventing the absorbed water from being lost by evaporation, helps to conserve moisture for the use of growing plants. Another capability of soils is their power of absorbing heat. This depends upon their colour; the darker the soil the more heat is absorbed. Here, again, comes in the great value of humus, which is usually of a dark-brown colour. The more water a soil contains the slower will heat be absorbed. Gardeners frequently place soot and coal-dust around their early cucumbers and other plants to force the ripening of their fruits. Soils also obsorb oxygen gas, or, in other words, they absorb the atmospheric aid which is necessary for the growth of plants. Soils well open, and properly tilled, will absorb oxygen gas more readily than compact soils. Drainage, especially in pot culture, by lowering the water content, will also permit the penetration of air.

Seeds require a great deal of oxygen gas when germinating, hence they should not be sown too deeply. Plants that get their roots covered by water are soon aspixiated by being unable to absorb oxygen through their root fibres. The tenacity of soils is mainly due to clay, and very finely divided particles of soil called "silt." All gardeners know the large amount of extra labour required to dig, or plough an acre of stiff clay soil, than is required for an acre of friable easily-worked loam. Plant food in all its complications is composed of about a dozen chemical ingredients; chief amongst these are nitrogen, potash, and phosphoric acid. These are the only three which are commonly deficient in soils, or if present, they are locked up in combinations which are more or less insoluble, and, therefore, not readily useable by growing plants. For that reason, these three ingredients of nitrogen, potash, and phosphoric acid are added to the soil in commercial fertilisers. Most of the other elements of plant food are found in the soil in sufficient quantities for plant requirements.

A soil to be fertile must not only possess "good texture" and the requisite chemical ingredients, but must also be possessed of "life."

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(Continued from page 253).

fore us a very interesting report. Circular 77, issued in June last by the U.S.A. Department of Agriculture, entitled, "A Study of the Improvement of Citrus fruits through Bud Selection," in which the scope and details of the work which was commenced two years ago and which is being carried on with the co-operation of several leading Californian citrus growers, is discussed. In work of this description it is of course necessary that it should be continued for a number of years, though valuable data is expected as the result of observations from year to year. In an introductory paragraph in the pamphlet before us, it is stated that it is issued not as a record of definite results but in the expectation that it may aid materially in assisting those who desire to work on similar lines.

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The Nomenclature of Fruit.

Mr. E. E. Prescott, Principal of the Horticultural School, Burnley, in the current issue of the Journal of Agriculture of Victoria discusses this subject which is one of great interest and very considerable practical importance to all fruit growers. It is, of course, true that a good fruit is good by whatever name it is known, and that the consumer who after all has the last word to say in the matter of the profit and loss account in fruitgrowing, is quite indifferent to the name as long as he gets flavour, aroma and suitability for his special purpose. It is, however, a matter of vital importance as between nurseryman and orchardist, that a name should have a definite and fixed significance. At first sight the multiplication of names for any given variety may not appear to be very material as long as under either name one gets the same fruit, as for instance in ordering either Cleopatra, New York Pippin or Ortley, Fameuse Snowy, Fanny or Pomme de Neige, one receives whichever one requires of the two apples, these six names stand for. Even in such cases confusion and serious disappointment may arise if for instance a grower hearing or reading good accounts of Fameuse orders a dozen or a thousand trees and afterwards finds that he has already been growing it as Pomme de Neige which under his conditions may not have proved a very satisfactory variety. It is, however, when the same name stands for two distinct varieties of the same fruit or for varieties of two different fruits, that confusion may become worse confounded.

The matter is one in which effective work can only be done by a representative body appointed for the purpose and the longer action of some sort is deferred the greater will be the difficulty of solving what is already a complicated and serious problem. The first move should, no doubt, be made by representative growers in Conference, who, in conjunction with the various State Experts, would probably be able to put up a scheme which backed as it would be by the practical orchardist as well as by the Government representatives of the fruitgrowing interests, should lead to a workable arrangement on the lines quoted by Mr. Prescott, such arrangement to be as far as possible retrospective in its scope and to be enforced as necessary by Federal and State authority.

Mr. Prescott writes:—It is quite right that each variety of fruit should have a name, and it is only natural that the man who raises a new kind should have the privilege of naming i, ; but it is just here that trouble is likely to ensue, and serious trouble. A man in an obscure country district raises a new fruit—either by a chance seedling, by cross-fertilization, or perhaps he comes across a good bud variation or sport. He finds his result to be good; he gives scions to his neighbours; or, may be, he sells the whole stock to a nurserymen for commercial usages. Then the new fruit is given a name. Probably, neither the raiser nor the nurseryman knows much of pomology, and as a result the fruit is given a name which is already in use. Then, in a few years, confusion, and irritating confusion too, arises. This has really occurred; and not only in fruit, but also in flower nomenclature. A permanent committee, with power to revise names, would prevent all this.

Again, a nurseryman may go in for raising new varieties as a specialty; but, unfortunately, his ambition is to prefix or to suffix each variety with his own surname, and he gives to the world perhaps twenty or thirty varieties of fruit with his name as an addition to the fruit name; and thus we have Smith's Red apple, Smith's Superb plum, Smith's Superior plum, Madam Smith, Bergamot Smith, Smith's Scarlet, and so on—Smith, of course, being here used impersonally. We actually have an "Early Rivers" apple, peach, cherry, nectarine, plum, and damson; a "Thomas Rivers" apple and peach; a "Dr. Hogg" peach, pear, strawberry, and grape; and a "Coe's Golden Drop" apple and plum.

It is only fair to a man to credit him with a desire to hand down his name to posterity in one or two good fruits; but it becomes tiresome and confusing when he wishes to prefix or suffix his name to every fruit he produces, no matter how good it may be. There is the useless and unnecessary multiplication of words; and, in the American Pomological Association, such names are not allowed, only in very exceptional circumstances.

We must not credit everybody with the desire to err in multiplicity of naming fruits. It is just possible, in fact, it has happened, that growers in different parts of the world, and at different times, obtain equally similar results. A case in point is that of the Plumcot, a hybrid fruit raised recently in America by Luther Burbank. Burbank raised this as a cross between the plum and the apricot. The fruit is as large as an apricot, with a deep purple velvety skin. It possesses an apricot-plum flavour, and has attributes of both fruits. Yet it is known that, in two places in Victoria at least, trees almost exactly similar to the plumcot have existed for many years.

Another instance is just as remarkable. Bakehouse's Bergamot is a pear introduced from Tasmania many years ago by the late Mr. Wm. Elliott. It is a remarkably fine flavoured fruit of excellent quality, and has been much admired as an exceedingly superior pear. This year, an amateur grower of Oakleigh submitted to me some pears for an expression of opinion. The pears were grown on a seedling tree which was raised from seeds of a late culinary pear. My report on the pear was to the effect that, as the fruits were exactly identical in appearance, quality, and flavour with Bakehouse's Bergamot, it was not advisable to retain the pear as a separate variety.

It is thus seen that Nature, in different parts of the world, repeats her successful efforts.

Two instances might be quoted as to how confusion will frequently arise. For many years orchardists have been growing the well-known apple, Stone Pippin, which is deservedly considered one of our finest winter fruits. The origin of its name, Stone Pippin, is obscure, as it is certainly not the true Stone Pippin—this apple is of Scotch origin, and is correctly known as Gogar Pippin, which is most unlike our Stone Pippin, being a true dessert apple of sweet flavour. The colonial Stone Pippin is really an apple of German descent, known as Gruner Furstein. Possibly, some early German colonist brought the apple from the Fatherland, and, from its hardiness, it received the sobriquet of "Stone Pippin." There are three old English apples, known respectively as Birmingham Stone Pippin, Norfolk Stone Pippin, and Somerset Stone Pippin. The colonial Stone Pippin, or, more correctly, Gruner Furstein, while it does not accurately answer to the description of any one of these apples given by English pomologists, yet in certain features it bears a resemblance to the three, and more particularly to the Somerset Stone Pippin. Thus, probably some of the early growers, noting this resemblance, named it Stone Pippin.

Again, we have our very excellent dessert apple, Cleopatra, or New York Pippin. Over forty years ago, Mr. Wm. Clarson, the then Director of the Burnley Gardens, in writing of the apples in the Burnley collection, recorded of this apple "true name not known." It is certainly not Cleopatra, for there is no recorded apple of that name; neither is it New York Pippin, for the true synonym of that apple is Ben Davis. The correct name is Ortley, under which name it is largely grown in America.

(To be Continued),

The Physical Properties of Orchard Soils.

(Continued from page 208.)

Soils have many important functions, these are (1) to uphold and sustain the plant, and afford it a safe and secure anchorage; (2) to absorb air, water and heat, and retain these for the promotion of the growth of crops. The above are its mechanical and physical functions. (3) To supply to plants food of whatever kinds may be required for the profitable growth of crops; (4) to give effect to all those chemical changes which are required to produce the changes in the various elements of this food by which they are prepared for admission into the roots and circulation of the plant. These functions of the soil are performed in a very inadequate manner by nature, but while nature contributes the materials and the forces by which the materials may be made available, the use and direction of these are left to mankind, whose labour gives effect to them. All the operations of the worker are intended to make these materials and forces available, to aid and assist in and give full effect to the performance of these functions of the soil by all those methods which are included in the term "cultivation."

— The Subsoil. —

What has been said hitherto regarding the soil, properly speaking, applies also to the subsoil; this latter has been formed in a similar manner, that is, by the breaking up and decomposition of rocks, and, naturally, its chemical composition and physical properties are intimately connected with its mode of formation. Generally speaking, the subsoil is of the same origin as the surface soil, but sometimes it is of an entirely different nature. Even if the subsoil is not accessible to the ordinary implements of tillage, it is nevertheless of great importance to the nutrition of plants, because their roots search very deeply for food. When the subsoil is of a different constitution to that of the surface, it is often useful to bring it to the surface, and thus add to its improvement. Thus some soils which rest upon a lime subsoil are deficient in lime, and in such cases an admixture of the subsoil with the surface is always attended by good results. In most cases the subsoil is not so fertile as the surface soil, especially as regards its content of nitrogen, for the stock of humus in the subsoil is always inferior, and humus contains the greater part of the nitrogen of the soil. As regards phosphoric acid, the subsoil, provided it is of the same origin, usually contains as large a quantity as the surface, and the same remark applies also to potash.

— Sterility. —

A few words as to some of the causes of sterility. Sterility in soils is generally due to the absence of fertilising matter, but in some cases it can be attributed to the presence of substances which act upon the plant as veritable poison. Among these iron sulphide or pyrites is not uncommon; this substance is injurious because it absorbs the oxygen of the soil, and thus produces asphyxia of the roots, and because also it produces sulphate of iron, whose caustic properties are injurious to plants. According to Voelcker soil containing ½ to 1 per cent. sulphate of iron is unsuitable for cultivation. Sodium chloride or common salt in many places causes large tracts to be unproductive; large quantities of magnesium and potash salts, especially when in the form of chlorides, are also harmful, and a superabundance of nitrates, also produces fatal effects. Impermeability of the subsoil, or of the soil, is opposed to the development of the roots, and may also be considered a cause of sterility. The presence of excessive quantities of acid organic matters, as in many peaty soils, does not make them suitable for cultivation. In some cases, the causes of sterility mentioned above may be remedied or removed; aeration and liming of soils containing sulphide or sulphate of iron decompose and break up these injurious salts, forming sulphate of lime and oxide of iron. Sourness is effectually removed by liming, marling, and applications of phosphoric manures, especially basic slag.

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The Rosella

Though more particularly suited to tropical or at all events subtropical conditions, the rosella will grow and fruit throughout the greater part of South Australia. In Queensland it is largely cultivated and its product, or rather one of them, is made into jam on a commercial scale. In the southern section of U.S.A. it is now somewhat extensively grown as Jamaica sorrel, and used as a substitute for the cranberry, which it is said to greatly resemble in flavour, in the making of sauces, jellies, etc. It is an annual plant and usually propagated from seed, which in this State should be sown on heat in July or August or in the open in October or November. In Queensland, under ordinary conditions, mid-October is the time recommended. When sown the seed germinates very rapidly, as the seedlings show above ground in less than a week but the percentage is generally said not to be high, so that fairly thick sowing is necessary, still a 6d. packet will give far more plants than the ordinary amateur can have any possible use for. Under suitable conditions, that is a warm position with a reasonable amount of moisture the plant makes rapid growth, say, up to five or six feet in sixteen weeks from seed. The yellow flowers are developed singly, they last but a few hours and then the calyces, which are the parts used, commence to grow, this process is very rapid, three or four weeks usually being sufficient to bring them to picking size. If picking is done as soon as the calyces are ready others will develop from latent buds and a succession of fruit be secured. The plant does not appear to be fastidious in the matter of soil, it is said to grow well in anything from a light loam to a fairly heavy clay. Good drainage, however, is a necessity, and deep digging for the plant is deep rooting. Heavy manuring is not in any case necessary but a light dressing of phosphate and potash is recommended. If grown in a seed bed the seedlings should be transplanted to their growing quarters when they are three or four inches high, and should be set six feet apart. Seedlings appear to transplant quite easily but will want some shading if the weather is hot. An easy and safe method of growing them is to set a few seed in each of as many four-inch pots as you want plants, and thin out to one plant when they are up. Grow on in the pots till the roots begin to fill the space and then put out, by this means any check at planting time is prevented. At this time sowing can be done where the plants are to stand. When doing this prepare a patch of ground two or three feet square, sow a few seed in the centre, cover with half an inch of nice free soil. When they are up thin out to the strongest plant. Protect from slugs and snails, which are very keen on these seedlings. We remember reading in the Queensland Agricultural Journal that the Rosella was sometimes propagated by cuttings of young wood, and that if this was done more vigorous plants and larger calyces resulted. In this State such plants would have to be carried over winter under glass, probably with some heat for a very little frost is said to kill the rosella at any stage of its growth. In addition to its growth for jam jellies, etc., also pickles, the rosella is largely grown in India, of which country it is a native, for its fibre, which is known in commerce as rosella hemp. The leaves are eaten as salad and the seeds are used as a poultry and stock food.

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Thinning Fruit.

This is always a sore point with the amateur fruit grower who may from past observation, have come to the conclusion that nature will do all the thinning necessary. Nature certainly will do something, but generally speaking, a well grown, well cultivated tree, in a good season will set and develop three times as much fruit as it can bring to a reasonable degree of perfection. For instance, on a piece of peach wood now before us, not quite 12 inches long, and taken quite at random from the tree, there are 22 small peaches about half an inch long, as there are scores of similar shoots on the tree, the tremendous strain on it if all were allowed to remain can be understood. In that case Nature would of course do some thinning, would probably reduce the 22 to 16, apart from the possibility of more drastic treatment by a passing hail storm or a gale of wind. These sixteen if left, would probably develop into fair quality, rather less than medium size peaches, except that several of the twin fruits would be of lower grade. The amateur, however, wants something better than that and the way to get it is to thin each such piece of peach bearing wood down to six, our own limit will be three, but we know that such advice would horrify beginners. By leaving six some weight of fruit will be lost but not as much as appears at first for the reason that the proportion of kernel and pit will be very considerably less in the six than the 16. By reducing the six to three we lose more weight but we shall get as perfect fruit as a tree of that variety is capable of producing, and further, it will be in the best possible condition for setting and maturing a similar crop next year. The time to thin in this particular case is now, and it should always be done before the pit begins to harden. If you are going to thin do it at once for it is certainly absurd to allow a tree to develop fruit which is to be thinned next week. It is usually just as well not to mention fruit thinning to the womenfolk of the house, for we never knew a lady yet who did not think it was a horrid waste of fruit. Even when the proposition pans out all right they are apt to lament the hundreds of thinned out marbles which in their opinion would have been just as good if they had only been left. No, in this case also it is wise to do good by stealth, not in fact to let the partner of your sorrows and salary know what you are up to. As for the man who grows peaches for sale and has not tried thinning it should only be necessary to point out that the most successful growers of dessert peaches are converts to the thinning process and the harder they thin in reason, the more successful they are. Of course they do other things as well, but thinning is certainly not the least important factor in profitable peach growing. Apricots are such abundant bearers that the amateur with more than a very few trees is, in a good year at a loss to know what to do with his crop, which he can neither use himself, or sell at a reasonable price or even give away, that is unless he provides a basket, picks it himself and well, we have even been asked to "bring it round." We did; also a few remarks, truthful enough, of course, but not untinged with a little mild sracasm. Even the birds fail one at times, though it must be admitted that they are honest, constant workers in the cause of crop reduction. Anyway, try thinning. Where there are a dozen fruit on a spur leave two. The result will be a revelation as to the size, flavour and juiciness of which the apricot is capable. If you thin fruit you will be surprised at the ease with which you can dispose of these gilt edged apricots.

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Birds and Fruit.

It is not often that fruit and berry growers take so kindly a view of bird life as the following correspondent to an English paper, who writes :—

"I live on the side of a river and grow fruit. I live in an atmosphere of birds, but I preserve my fruit. I had a gardener once who set to work shooting birds because an army of tits stripped a cherry tree of its buds in a single morning. I stopped him, and explained that no amount of shooting would mend matters. You must protect the fruit and encourage the birds to do their office of protecting the trees from grubs. The water brings the birds, and I feed them on the principle that when birds cease to be hungry they cease to be mischievous. I have blackbirds, thrushes, the whole finch tribe, the wagtail, and innumerable sparrows. The thrushes clear my lawn of worms. I have not a slug in the whole place, and the fruit flourishes because the birds do their office, and I protect the fruit. It is far easier to protect than to shoot, and while protection is effectual, shooting is ridiculous.

Blackbirds and thrushes like strawberries, and strawberries I protect by erecting over the entire bed a tent of netting 6ft. high. Once arranged, it is good for years. Pears I protect with bags made of mosquito net. When properly grown pears cluster, and a bag may enclose half a dozen. No birds touch them; the fruit is the more delicate in the result, and the string of the bag being passed over a neighbouring twig, if the ripe fruit falls it hangs in the bag. Those who know nothing about it and want to shoot sparrows, exclaim, "What a cost, and what labour!" Nothing of the kind; a few shillings and a few hours, and the bags last for years. As you go on year by year you accumulate thousands of bags, you get your fruit, and the birds serve you by taking the grub.

So convinced am I of the soundness of this policy of protection, that I contemplate covering about a quarter of an acre of choice fruit trees with inch mesh wire from a high wall; but I shall give free entrance to the birds for nine months in the year. I regard them as a necessity, and put them in the category of root pruning and other little attentions not generally observed."

A RECORD ! !

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Vegetable Garden.

Summer Beans and Bean Growing.

With the exception of the tomato there is probably no vegetable so largely grown in the home garden as the bean. This is not surprising for seed is cheap, it germinates well, cultivation is simple, with the exception of red spider the plant does not seem to suffer greatly from insect or fungus enemies, it matures its fruit in a few weeks, the weight of specially nourishing food one is able to grow on even a small patch of ground is considerable, and finally, any of the beans improve rather than impoverish ground on which they are grown. With so much to recommend it, its popularity is easily understood.

Members of the bean tribe thrive on a wide variety of soils from rich volcanic to clay on the one hand and to thin sandy loam on the other. A rich quick loam with sufficient sand to permit of its being easily kept in good mechanical condition, fine, but compact with good moisture retaining capacity, but with no tendancy to cake after rain or irrigation, would probably be the class of land which experienced growers of this crop would prefer to any other, but no one need be deterred from growing it, especially in the home garden, because the ground does not happen to be just right. A good depth of soil is always a great advantage, so in this as in most crops it pays and pays well to be thorough in the digging. With quick growing plants coming to maturity as do the beans within a period which may be reckoned by weeks good feeding room and a plentiful supply of necessary plant food should be regarded as an absolute necessity. Another point of importance to be remembered, is that the surface soil should be free and open. Anyone who has noticed the manner in which the young bean lifts itself out of the soil will understand that any caking of the surface may be fatal to the seedling, which under such conditions may never appear above ground at all. In the home garden where the soil is stiff it is a good plan, after sowing the beans to fill up the shallow trench in which they have been placed with some nice free sandy soil with which some old manure has been mixed. A mulch placed over the bed after sowing has much to recommend it, but a decided objection is that it usually contains and provides a harbour for slugs which are death on beans. If the soil crusts unexpectedly after the beans are sown they will come through all right if it is kept moist. As soon as they show above ground is the time to begin the soil stirring process which is quite one of the most important items in growing a heavy crop whether one is growing it by the rod or by the acre. The time to leave off is when the vines have finished fruiting. In slug infested gardens some precautions must be taken otherwise disappointment will be the result. There is probably nothing to beat the old fashioned remedy of good lime dusted through an open textured bag. Superphosphate sprinkled lightly over the rows, also Pestend, or any other preparation of tobacco are also good. It is just as well to remember that it is not enough just to scatter any one or all of these over the bed, for unfortunately they soon loose their virtue especially as watering will be the order of the day, so that frequent renewals will be necessary. Fine gritty coal ashes are a reasonably effective bean protector and are of course much more lasting in their effects. Having got the plants through their early troubles, growing them on will not be difficult, and can be summed up as depending on the hoe, the liquid manure can, and the hose or sprinkler.

From what has been said of their quick growth it will be apparent that a good supply of quickly available plant food is important. This may be provided either by natural or artificial means, preferably a combination of both. As all members of the bean tribe gather nitrogen from the atmosphere it is sometimes concluded and recommended that any addition of this element of plant nutrition is not necessary. Experiments have, however, shown that nitrate of soda at the rate of two hundred weight to the acre gives a large additional weight of crop picked. Instances are on record where this addition to a liberal dressing of super and sulphate of ammonia has resulted in a gain of from 40 to 50 per cent. in amount of produce marketed. This is probably more important in the very quick growing beans in which the young green pod as in French beans is the part used, than where the plant is to be allowed to mature its seed, for in the former case the plant has less opportunity to obtain and utilize the nitrogen of the atmosphere. A satisfactory complete manuring for this crop is at the rate of 12 to 16 tons of farmyard manure, 4 cwt. of super, 1½ cwt. of sulphate of potash, or its potash equivalent in kainit. These to be applied before sowing, and 2 cwts. of nitrate of soda used as a top dressing and used in two or three applications during the growth of the plant. For the home gardener who usually makes his calculations by the rod or 100 ft. this would be about equal to 2 cwts. of stable manure, 3 lbs. of super, 1 lb. of sulphate and rather less than 1½ lbs. of nitrate.

VARIETIES.

— Phaseolus Vulgaris. —

By far the most popular of the beans is the dwarf French bean and of these the Canadian Wonder is still the most largely planted, though several varieties of the same type, which are either wax or green podded are well worth growing. Last season we saw a crop of Northern Star, a variety which we have not seen listed in any local catalogue, which when compared with Canadian Wonder growing along side were more dwarf in habit, more productive and a fortnight earlier in coming into bearing. Others of this same type which can be recommended as quite satisfactory are Golden Wax Pod, Canadian Glory, White Caseknife, Emperor William Improved, and Bountiful which with us appears to be one of the very best flavoured of all. All of this class should be sown either in single rows four inches apart, each row 18 inches to 2 ft. from the next, or in double rows six to nine inches apart with the beans 4 to 6 inches apart in the rows which should be from 30 to 36 inches from row to row. For hand cultivation the former method is, we believe, to be preferred, but where horse implements are to be used the double row has the advantage. Depth to sow will depend on soil and season. For early planting and in heavy soils, shallow sowing, say 1½ inches is sufficient. For lighter soil and later in the season they may be set at twice that depth. The amateur gardener who averages 100 lbs. picked beans per rod will be

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doing very well and it will need good cultivation to get it, for that is practically 7½ tons to the acre. It has, however, been done on a large scale and there is no reason why the home gardener with an interest in his hobby should not do as well. The average picking in market garden work is, of course, considerably less than this.

— Phaseolus Multiflorus. —

The old favourite Scarlet Runner, so popular a plant in English gardens though less commonly grown with us, is the type of this class. The fact that they need support either poles or trellis and are therefore more expensive to handle put them out of consideration for the market gardener; but on the other hand as they are a much more handsome plant, give some variety to the appearance of the vegetable plot and are useful for covering fences or for making screens is sufficient reason for their use in the home garden. They do not come into bearing as quickly as the dwarf sorts, but the total weight of beans pulled is much greater from individual plants, and as large—if not larger from any given piece of ground. When grown on poles, which should stand five feet out of the ground, half a dozen seed should be shown, about 2 inches deep, around each. These poles should be 5 feet apart each way and the plants loosely tied as they make their first growth, after this they will do their own climbing. The Ten-Week is said to be one of the best and this year, the first we have tried it, is making good headway. Butterfly is a particularly handsome variety. The Wax pod climber and Kentucky Wonder are both excellent sorts. When growing in running rows on fence or wire trellis drop in a seed every six inches and when they are started thin out to 1 ft. apart. This type as well as the dwarfs respond well to weekly applications of liquid manure.

— Phaseolus lunatus. —

The Sugar or Lima beans are grown both of the pole and dwarf types. They are a very useful sort for hot districts as they revel in heat as long as the moisture supply is kept up, though they will stand much more dry conditions than the sorts we have already mentioned. Unlike the pod beans of which the French and Runners are illustrations, in the Lima, the bean itself is the part eaten, these which are similiar to the Broad Bean, but of more delicate flavour are either cooked when green or may be stored for later use. Burpee's Bush is the true Lima. It is a dwarf and is best planted in drills 30 to 36 inches apart with half that distance between the plants. Rich soil appears to be a necessity for good Limas for we have noticed an extraordinary difference in plants which have had a more than usually liberal supply of super. Challenger is recommended as the best pole lima.

— Various Beans. —

The Asparagus or Snake bean is one of the Dolichos group. It is a decidedly interesting variety because of the length of the edible pods. They are used as French beans and are of agreeable flavour. They are useful for covering fences. If grown in the row they will need staking as they grow to five or six feet in height. The Cossack Bean is another substitute for French beans. It is a perennial and makes an effective covering for a fence or division in the garden. The Madagascar Bean is another perennial climber; the fruit which is very abundant is also a very useful addition to the list of vegetables for the home garden.

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Preparing Garden Ground.

Reply to X Y Z:—In preparing your soil, heavy loam on clay, though you do not mention the depth of the former, there is no doubt that the whole ground would be better for trenching, or, at all events, bastard trenching, but the clay material beneath should not be brought to the top, although it may be slightly mixed. Keep the clay material mostly in the bottom, but in after years it may be gradually incorporated, and the top soil and subsoil will benefit greatly by the mixture, giving the plants a much greater root run. The best manure would be something containing plenty of litter, straw, etc., fibre, that would have the effect of making the subsoil more porous. It should be put in at the time of trenching, and it would be advisable to use the larger proportion of it in the clay soil below, but particularly the ranker portions. Leave the soil quite rough, or even in ridges, on the top until you are about to prepare it for planting, when you can use a fork in levelling down, so as to break up the soil as finely as possible. A dressing of lime would very likely be of considerable advantage. It should only be forked in about 2in. or 3in. as it has a tendency to get downwards. As to manure, you cannot make any mistake in adding stable manure. Just how much you may apply depends upon the expense to which you care to go. From 20 tons to 25 tons of farmyard manure per acre would be a fairly good manuring, but market gardeners, who frequently trench their land and take off heavy crops, may give it a hundred tons of manure per acre. At the former rate you would require to use two or three hundredweight per rod, and that is by no means a heavy manuring for garden soil. If you do not object to the expense you can use this manure freely, during the first year or two at least.

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CLEMENTS TONIC

CURED HER.

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She: "When a man starts to talk he never stops to think." He: "And when a women starts she never thinks to stop."

Home Vegetable Garden Notes.

We are now well into the time of summer vegetables. Those who made early sowings in favourable places should soon begin to reap their harvest, unless indeed one of the enemies of the early stuff, frost, hail or slugs have upset one's little plans. To the amateur one or other of these visitations are merely a variation of the old lesson about not counting one's chickens till they are hatched. To the market gardener, however, they are a much more serious affair.

BEANS.—Sow, hoe, water and mulch. It is still quite early enough for main crop sowings in most places. The same for

CUCUMBERS, Marrows, Melons Squashes, Pumpkins, and Trombones. Give liquid manure. Pinch out runners as necessary. For future sowings, use only early maturing sorts.

ASPARAGUS.—As next season's cutting will depend on getting good strong growth this year, keep the beds weeded, watered, and loose.

TOMATOES.—Early fruit has already been on sale—at 2/- per pound. Many amateurs will have fruit ripening. Stuff put out now will do well, the earlier it is in the better. If sowing for late crop select one of the quick growing dwarf kinds. Don't water or manure tomatoes too freely when they are making growth. After the fruit is half way to full size much more water should be given. If clean, unblemished fruit is wanted, tie up the growing stems to stakes or to a rough trellis. Such treatment reduces the chance of disease. If any fungus trouble comes along use Bordeaux mixture.

SPINACH.—This useful vegetable and its numerous substitutes White Beet, French Spinach, or Orack, New Zealand Spinach, Vegetable Rape, Swiss Chard, etc., all require the same treatment, i.e., plenty of water and soil stirring for growing plants. Orach is not grown as it should be. It can be sown now either in drills or seed boxes. Sow fairly thickly. If in drills, which should be 2ft. apart, thin out to 18 inches apart when the plants are three or four inches high. If grown in seed boxes plant out at these distances. New Zealand spinach is said to be more drought resistant than true spinach. The seeds or rather seed cases are large and should be planted singly in boxes or beds two or three inches apart. When the young plants meet transplant the little clumps to a bed of deep soil and set 30 inches apart each way. This vegetable is well worth trying.

SALADS.—Lettuce is hard to grow on the plains except in specially suitable places. If tried it should be sown in drills where it is to grow and the seedlings thinned out. Radishes grow so quickly and freshly pulled stuff is so much better than what one gets from the greengrocer that sowings should be made once a fortnight. Sow in drills 6 to 12 inches apart according to variety grown, afterwards, thin out so that the roots do not touch. Do not use fresh manure but choose a bed of light rich soil. Any variety of radish is good as long as it is grown quickly and pulled when young. The round and olive-shaped sorts can be grown in very shallow soils, the long varieties, of course, require a greater depth. They can be had ready for the table in from a fortnight to three weeks from sowing. Sow thinly as the seed usually germinates very freely. Mustard, Cress, and Rape, the garden variety, should be grown in sufficient quantity in every home garden for they are a healthy vegetable food. Onions for salad should also be sown.

EGG PLANTS. — Early sown stuff will be ready to put out but sowings in the open can still be made for the soil needs to be quite warm for the seed to germinate. Earliest Delicacy, one of the small fruited sorts, is an excellent variety. Thirty inches apart each way is sufficient distance to allow. Select a light rich soil which is well drained. Do not use stable manure unless very well rotted. There are several ways of preparing this vegetable. The fruit should be ready to use in about three months from sowing.

CAPE GOOSEBERY.—A very productive but neglected garden plant. The fruit is of a pleasant flavour when eaten fresh and is also valuable for making preserve. Put out the plants 30 inches apart each way or sow a few seeds at that distance and thin out to the strongest before they begin to get crowded. They do best when loosely tied to stakes. A loose soil, not over rich, will be found suitable to this plant, which is variously known as the ground cherry or husk tomato in America where it is largely grown. There is a large fruited variety, a native of Japan, which is a very handsome and useful plant.

For November sowing it is best to shade all seed boxes and seed beds, and it is necessary to keep the soil just moist. In transplanting it is always worth while waiting for a suitable day if the weather is hot. In any case it is better to move seedlings towards evening than in the morning. A few leafy twigs placed around a newly set plant will help it along wonderfully. A flower pot or small box used to cover such stuff during the hot hours of the day will be even better. For covering a seed bed a thin bran bag cut open and tacked to a frame will be found very useful or some coarse cheese cloth will be even better.

A. F. TELFER.
Produce and General
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TRY
HARDY'S
FAMOUS
WINES

The Farm

Wild Oats.

An Australian farmer gives the following advice in the Leader with regard to eradicating wild oats :—

" Just as soon as the crop is cut, and before the surface gets sun-baked, stir deeply with the scarifier, and at intervals again scarify till the ground is stirred to a depth of about 3in., so as to give the wild oats a chance to germinate, and when sufficient growth has taken place feed off with stock. Repeat the operation, and the surface to a depth of 3in. will be clear of wild oats, but underneath that depth they will be the same as when last ploughed down, and they will retain their vitality for any number of years till again brought to the surface. Therefore, after the surface has been eaten off, plough the land to the depth it has been formerly ploughed, thus bringing up all the buried wild oats to the surface. Then with occasional scarifying and seasonable rains those oats that were buried, but now brought to light and encouraged to grow, can be fed off, and the land, if not perfectly clean, will be safe to crop with wheat for several years. The reason many fail to eradicate the pests is that they spell the land, feed off all wild oats, get the surface perfectly clean, but neglect to plough up the oats that are 4 or 6 in. under the surface. They are under the impression that they will rot or die, but this impression is an erroneous one."

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Breeding Dairy Cattle.

A subscriber to Hoard's Dairyman asked the editor of that journal the following questions :—

1. Suppose you have a dairy cow that is superfine, even delicate, but an excellent milker, showing perfect points, except that she is not strong enough, would you choose for her a mate that is rather coarse and angular and strong, or one that is fine-grained, compact, and robust, assuming that the milking habits of the ancestors of the bulls were equal ?

2. Given two cows similar in form and size—one coarse and the other fine-grained—which is likely to be the better milker and which the better breeder ? Would you breed them to the same sire ?

3. How would you select animals for the most successful "nicking" ?

The replies were :—

1. Coarseness in the male is not an indication of constitutional endurance. We should of course use only a male of strong, resolute vitality. Too great a degree of fineness is not a good thing on either side. However, constitution is not a trait of coarse angularity. Select a male of strong, prepotent nerve power, one that is full of nervous force and activity.

2. As a rule, the milking or dairy temperament inclines to the cow that has a feminine build, for the reason that it is a mother quality, or function. But femininity of outline does not call for weakness, or a degree of fineness that amounts to the same thing. We are inclined to say that we would not use such a cow as a breeder under any circumstances.

3. We would try first to secure a male and female of agreeing traits and function. For instance, if butter is what we are breeding for, we would unite male and female of butter-breed antecedents. Temperaments and tendencies of a disagreeing nature do not usually nick well.

The Jersey cow is powerfully prepotent in the line of depositing a high percentage of butter-fat in her milk. The Holstein is just as prepotent in the direction of a lower per cent. of butter-fat. These are two long-established traits, and they do not usually nick well. The union is too violent, and the result is apt to be anything but a cow that will exceed the Holstein in milk flow and the Jersey in percentage of butter-fat. So we say, in order to secure a good nick, all traits and tendencies should be somewhat in line and in sympathy with each other.

Bodily vigour or constitution is best indicated by the structure of the abdominal muscles. A strong, powerful lower belly is almost invariably an indication of great vitality. If either a bull or cow lack in this particular do not breed them if you can help it.

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When cattle chew leather, wood, or old bones it indicates a lack of phosphate of lime in their food, which is required to supply bone material. A teaspoonful of bone meal given daily with their food will correct the habit and supply the deficiency which induces it.

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LADY IN ATTENDANCE.

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Unnerved Horses

There is hardly any veterinary subject about which more misconception exists than that of nerving or unnerving—neurotomy, or neucrectomy, as those operations are variously termed—which are undertaken for the purpose of restoring lame horses to usefulness for a time. To Professor Sewell, one of the fathers of veterinary science, belongs the honour of having discovered this operation, although others professed to have performed it previously, but had not made it known. It was he "who first practised it and recommended it for incurable foot lameness," says Professor Spooner in his work on the "Foot of the Horse." "Like all other discoveries," says Professor Spooner, "it has met with assailants from all quarters, both in the profession and out of it; and not a few of them have been owing to the careless and indiscriminate manner in which many practitioners have performed it. The effects of such careless selections remain, two generations later, in the very general prejudice against an operation which we shall endeavour to show is a most humane one, and in the majority of cases adding years of usefulness to the life of an animal otherwise unfit for work, and ill at ease when unemployed.

Unnerving was first adopted in navicular lameness, a very much more common trouble, fifty or even twenty years ago than it is now, and for several reasons. Coach horses and roadsters geneeally were heavier, and were required to do longer and faster journeys with greater weights than is now the case. The practice of cutting out the soles and trimming away the frogs undoubtedly favoured, if it did not actually cause, first contraction, and then disease of the sensitive structures within. The diminution is also due to the substitution of wood for stone sets in town roads (whereby concussion is greatly reduced); improvements in shoeing with rubber and other substances; and, greatest perhaps of all, a widespread knowledge of the hereditary nature of the lameness. Until Turner, Percival, Spooner, Sewell, and others proved by unnerving that "grogginess" was caused by a disease in the foot it was generally assigned to the shoulder—an easy error to fall into, having regard to the short or "groggy" step which characterises what we now know as navicular lameness. Mares so affected were put to the horse as a means of paying their way while taking a long rest. Now it is quite a rare thing to find anyone breeding from such subjects.

For other lamenesses of the foot, besides navicular joint troubles, neurectomy is also practised. Experts cannot always discover the exact pathological condition; whether it is connected with the shuttle joint, the insertion of the tendons into the little bone which gives the name to the disease (navicular), or concussion in the bone itself, leading on to ulceration, either of its substance or of the articular covering; indeed, it is not always apparent on post-mortem examination whether the disease began from within or from the surface of the bone, and every degree of change or degeneration of structure has been noted, both in the bone and tendon which play under it during life. Cases there are, too, of diseased wings to the pedal bone; these nearly always occurring on the inside, and having perhaps some connection with the presence of corns which have grown out with improper treatment of the foot. The latter form of foot lameness differs in some respects from navicular, in not shortening the stride to the same extent, and in evincing no improvement when the patient is warmed with exercise. Osific growths or deposits, as ring bone and side bone, causing continued lameness, despite the oft-repeated blister, the firing-iron, and the long rest, may justify a final resort to the knife, for the division of the sentient nerves supplying them with the capacity for pain. Of late years, another neurectomy, known as median, has been much practised by Professor Hobday, Mr. Henry Gray, and others, for the removal of lameness due to causes above the foot. The median nerve is a large trunk, found under the arm, and supplies with sensation much of the limb below the knee; hence its division is sometimes practised for incurable lameness occuring below that joint; but above the foot, in which latter it is not necessary to divide so large a trunk, the plantar nerve above the fetlock being the usual branch operated upon, or in some other cases, where the seat of lameness has been localized to one heel, it has been found sufficient to perform what used to be known as the low operation, on the side of the foot, near the lateral cartilage so familiar to many readers as the place of sidebone. For incurable spavin and other hock lameness in hind limbs neurectomy is also resorted to, but with less success than attends similar performances on the front limbs, and for the reason that branches of other nerves endow the parts with some portion of their sensibility.

Having spoken of the relief of pain and removal of lameness as the usual result of unnerving, we may consider the objections, general and special. The operation is frequently spoken of as cruel. When chloroform was not employed, and tourniquets were not applied to make a "white" operation, it certainly did seem cruel, when one watched a man groping for the nerve in a pool of blood for a considerable time before he

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could carry out his intentions; but no such charge can be sustained against the modern method of total anaesthesia, and a bloodless operation performed in a few minutes. One may well ask if the charge of cruelty may not with greater propriety be applied to the man who keeps a horse at work which is always uneasy and frequently in acute pain!

Those who have not ridden and driven many unnerved horses are apt to declare them unsafe, more liable to come down, and give their reason for this belief by stating what is an undoubted fact—namely, that the animal has no feeling in his feet. Spooner states the case well when he explains that "as the motion of the limbs is effected by means of the contraction of the muscles, and there are no muscles below the knee, there are only motor nerves, no sentient ones." The foot is operated by pulleys (tendons and ligaments attached to muscles above the knee), and an unnerved horse quickly learns that it does not hurt him to lift his leg high, and put his foot down fair and square; and it is the writer's experience that the tender-footed animal (while suffering from navicular lameness) at once or very quickly regains his original action, unless he has lost mobility by adhesions in other joints or parts of the limb, and from other causes than that for which he was operated upon. There are men who declare they can recognise an unnerved horse by his action, but there are many more who have ridden and driven them without suspecting any unsoundness; equally good judges, be it understood. There never was feeling in the foot, and a sound horse (or an unnerved one) should be as unconscious of having any feet as a sound man is of having a heart—all the time the feet of the one and the heart of the other perform their respective work satisfactorily.

A general objection to an unnerved horse is the more or less known risk of his becoming absolutely useless at any time; but is not the comparison, in the mind of the objectors, as between a sound animal and one so operated upon? Such a comparison is not fair. The animal upon which neurectomy has been successfully performed must be compared with the cripple for whom no other remedy could be prescribed. The risks are many and somewhat in proportion to the judgment of the man who decides on operation, and the stage of disease at which it is undertaken. An unnerved horse may be pricked in shoeing, or pick up a nail, or receive injury to his foot without evincing pain, and, through neglect of such treatment as other horses would receive, may lose his hoof. If the prick or the festering corn is discovered, it may be successfully treated, because the foot is not "dead," as some are heard to say; on the contrary, feet deprived of sensation usually grow much faster than they did before, and for the obvious reason that they again take their full duty in supporting the weight of the animal. This after-growth often leaves a margin of safety for nailing, in cases where an operator may hesitate to advise neurectomy. Where operation has been too long postponed, and degenerate tendons exist, the sudden extension proves too much for them, they give way, the heel fills, and the toe turns up, and nothing more can be done to postpone the journey to the kennels. Animals with weak, low heels, with corns or shelly feet, should be rejected as unfit subjects for neurectomy; but those with upright, "blocky" feet, with plenty of nailing room, offer a fair prospect of continued usefulness when unnerved. Some die of old age without developing any of the sequelae above referred to, and others give but a poor return for the outlay, and it would be difficult indeed to estimate the average life of an unnerved horse.

Some get their quietus through being blistered for some subsequent leg trouble, and with the result that the limb undergoes gelatinoid degeneration. — Harold Leeney, M.R.C.V.S., in English Live Stock Journal.

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Effect of First Impregnations.

Not long ago, in reply to an enquiry from Massachusetts, writes Hoard's Dairyman, we expressed the opinion that it has been very conclusively demonstrated in recent years that the influence of a first impregnation does not extend to subsequent impregnations. We knew then that there is a widespread belief to the contrary, and one of our esteemed friends in Pennsylvania writes us that our conclusions are "opposed to his observation, his experience, and his reading." And he quotes the reports of various instances which are assumed to support the theory of telegony—that is, that the influence of a sire is not limited to the immediate progeny, but may extend to successive births.

Among the cases cited is the reputed instance, a hundred years or more ago, of Lord Morton's mare, which bore a colt by a quagga, and subsequent colts were said to have signs of bars, on shoulders and legs, more or less resembling the quagga colt. This case has done duty during all the interven-years, and of course it cannot now be specifically disproved; but in recent years scientists, notably Professor Ewart, of Scotland, have diligently tried to reproduce such effects and have completely failed. Moreover, in the innumerable cases that are now occurring every year, where there have been changes of sires, it is significant that we do not have verified reports of conspicuous instances showing that the influence of first impregnations is continuous.

Of course, this kind of evidence is negative. It does not prove that such an influence is impossible; but it does prove that if it exists at all it manifests itself so infrequently that it may be disregarded—that is to say, if a heifer, for example, should chance to drop her first calf to a scrub sire, or to one of a different breed, her value has not been appreciably lessened, for there is no probability that subsequent progeny will be affected thereby.

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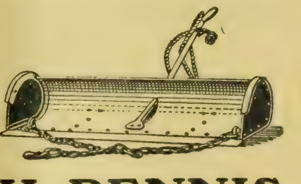
Colts should be trained to walk fast before there is an attempt to improve them in any other gait.

A stallion whose feet are contracted, and brittle, and whose hocks are puffy and fleshy-looking, should be avoided. Such hocks are generally associated with coarseness throughout his whole conformation and a general lack of quality.



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The Wild Instinct of Animals.

There is no country in the world where the conditions of life are so well adapted for domestic animals to maintain themselves in a wild condition as Australia. Horses, donkeys, cattle, sheep, pigs, dogs, and cats, and even human beings, can get away in the bush—not necessarily the driest and worst parts of it, and indulge themselves in a real good time. One cannot help but draw the inference that it is a good time, and that the life is peculiarly attractive, because each species shows a distinct dislike to returning to civilization. A writer in The Australasian, in writing on this subject, touches upon a few instances which have come beneath his own notice in the course of his experience, or in books he has read. He merely touches on the fringe of the question.

"There is probably no better field for research in attempting to analyze the why and wherefore of this inborn trait in animals than the continent of Australia. Notwithstanding generations of time during which our four-footed friends have been subjected to man, the wild instinct has never been bred out of any, save, possibly, the domestic fowl. One has but to watch a dog preparing to curl itself up to sleep on any level and bare surface to realize that its antics are such as it would put into practice were it preparing a nest for its slumbers in long grass. It does not, apparently, require several generations of a wild life to endow an animal with all the original wild instincts of its race. It at once becomes as much a wild animal as any of those bred from wild stock. Strange to say, a bird born and reared in captivity does not seem to be able to derive much satisfaction from putting these instincts into practice, any more than one which has been tamed: each speedily falls a victim to the beaks of its new associates. But place almost any domesticated animal in a position to join a wild mob or herd, and it will very soon fraternize with the strangers. Geldings and bullocks may not be accepted at once, but they find some sort of welcome among the females, even if despised by the males.

Troops of wild horse have been known in every State, though for many years their numerical strength in Queensland far exceeded that of any other State. There have not been many mobs of wild horses in the North since the disbandment of the Blanchewater herd, but the Flinders Range could, until very recently, boast of a considerable number of wild donkeys. Wild pigs were very plentiful along the course of the Willochra Creek for many years, but in numbers a mere circumstance as compared with the swarms which have got adrift along the tropical swamps of North Queensland.

The wonderful beauty and symmetry of form among wild stallions can never be forgotten by those who have had a good view of them, undisturbed, in the open. The coat is like satin, and the crest of such contour that, were the animal reproduced as a picture, the chances favour ninety per cent. of the critics pronouncing the leading and most attractive features gross exaggeration. "Bruni" cites an instance of an Arab stallion in Tasmania. This animal broke out of its stable and joined a wild mob. As it was a remarkably fine horse, every effort was made to recapture it, but without success, till age had told on its pace and staying power, when it was run down with the aid of two kangaroo dogs. One who saw this horse when captured described it as the most beautiful horse he ever saw. Beautiful as the Queensland or West Australian bumbies seem when thus leading a wild life, their whole appearance goes to pieces if an attempt be made to tame them. They can be tamed and made useful creatures, but no feeding, kindness, or attention with brush and currycomb ever restores their original and picturesque appearance. In the instance of the Arab above cited, the instinct which transforms such an animal into a thoroughly wild creature must be very great, because the Arab horse is, with the exception of the dog, the most domesticated of all animals. The dog, on taking to a wild life, seems to become lost to all sense of decency and gratitude; so recently the obedient servant of man, it readily becomes a greater curse than any other animal, wild or tame—at least, that is the view taken by all sheep farmers. A dog or cat will go in for a wild life by itself, and does not necessarily require companionship to arouse this instinct.

Wild men have been found in different parts of Europe, as well as in Australia. The dividing line between actual wildness and backblock existence, especially where men are brought in contact with the aborigines, is very slight. Even a taste of this class of existence seems demoralizing; it unfits a man for ever taking his part in the more serious walks of life. The instinct lies dormant in him, and may be aroused at any time. This instinct is one of the great drawbacks in the process of reclaiming or bringing up half-caste children. They may be taken in hand by European men and women at birth and removed from all risks of contact with the environments of wild life. Yet, as they grow up, their spirit of restlessness asserts itself, and is usually much too strong for anyone to entertain seriously hopes of making a staid and respectable citizen or citizeness (as the case might be) of the subject. Some years ago a case was before the public, and made much of in the Press, of a man who, with two children, took to a wild life in some remote district in the old country. He lived thus for a considerable time before he was discovered, and was finally arrested under the Va-

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grants' Act. The surprise of the discovery was to find all parties, including the children, notwithstanding a life in the open, and almost without covering of any sort, remarkably healthy and strong. Escaped convicts have done some surprising things in the past in the way of leading a wild, nomadic existence. Climatic conditions are much in favour of a life of this description in almost any part of Australia, but this is by no means the case always with regard to food supplies. Without experience gained from the aborigines, few Europeans could put up a fight against starvation.

Strange to say, the domestic fowl—which is cited as an exception in which the wild instinct seems dormant—is stated to have gone wild in a scrubby district in New Zealand. The type is described as about the size of a Hamburg, but longer in the body and higher on the leg. They were of dark colour, without any white, and altogether a conundrum as to origin.—Elder's Review.

Keeping the Cow Fed.

Permitting a cow to fall off in her milk for want of suitable food is bad management; even if she can be restored to her full flow, which is doubtful, it takes more food to do it than would have been required to keep her in good milking trim from first to last. Cows, to do their best, must be pushed with food of the proper kind, and the more the better. You can't get milk without food. No food, no milk; little food, little milk; plenty of good food and proper care, plenty of milk for a long time.

About Heifers.

Some heifers require better feeding during pregnancy than others, and, although a superfluity of fat is no recommendation in successful calving, a lack of healthy condition points to insufficient stamina to sustain them through the calving. When the condition of the in-calfs is not up to the average standard, further feeding should be resorted to, and that of a nourishing nature (says a correspondent of the Farmer and Stock Breeder). I had a very bad case to deal with once. The animal had not been stinted so far as ordinary grazing goes, and the rest of the herd was in good condition. A waster they said she was, but I had my ideas. She had a rough passage at calving—exhausted almost to death—but she pulled through, and made a good cow. Since then I have seen the advisability of feeding with trough food when an in-calf heifer's condition goes down under ordinary grazing. I would also condemn very early mating—that is, generally speaking—and really, personally, I would never advocate such a course, although practical men have suggested advantages in specific cases. From a utility point of view I fail to see any advantage, and from the aspect of successful calving it adds to the risk, especially if a big breed of bull be put to the young heifer. If, however, this course be the order of the day, always mate a small breed of bull to the young cow. Heifers, like the more matured cows, sometimes go a bit over their record time to calve—sometimes a week, and even more than that; and although this is quite a natural course, it is well to be suspicious of trouble, and if any prolonged straining is noticed, professional skill should be called upon. The udders should be looked to, especially if the quarters present an irregular appearance in size, as it often occurs that one quarter will go wrong, and the others keep in good condition. In such cases it is as well to keep them well milked out, leaving the hungry calf to knead them about. This is a natural massage which is very beneficial. The calves of heifers should always be allowed to suckle their parents for a week or two after calving.

The Motherless Foal.

The main thing (says The Breeder's Gazette) is to gain an accurate knowledge of the ways of the foal and the reasons for these ways. A foal sucks many times a day when it is well and hearty, but it gets only a little at a time. Too much feeding will promote indigestion and scours, but there is no reason why this should occur if commonsense is used. In the absence of the mare's milk cow's milk must be resorted to, and it should be fed new and warm at first, with a tablespoonful of ordinary white granulated sugar to the pint of milk. This may be fed in anything from which the foal will take it, but the best thing we know of, and one that is available on every farm without any expense whatever, is an old china teapot. Over the spout tie the thumb of a kid glove, pierce a number of small holes in it with a darning needle, and let the foal suck the sweetened milk from that. It forms a very good imitation of the maternal dug, makes some good work for the foal to get his ration, and prevents the ingress of large quantities of air. At the first, for a very young foal give him half a pint or even less, and let him have it as often as he would naturally suck the mare, which may be from six to eight times in the twenty-four hours. If you want to do the thing right the foal must have attention at night as well as during the day at first. As he grows stronger he will take more at a time and he may be fed less often. Still later teach him to drink from a bucket, and feed him on all the sweet skim milk he can take to advantage four times a day. Always remember to keep the feeding apparatus scrupulously clean.

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The Sow.

"A thing well begun is half done." This old adage is as true in the pig business as anywhere else. If a litter of pigs are to make the largest growth at least expenditure of time and feed, they should be started right. The sow should be fed right before farrowing. She should have plenty of exercise, and be provided with a clean, warm sleeping apartment. After farrowing she should be fed a ration rich in protein and ample for her needs. After the pigs are three or four weeks old they should be fed, as otherwise they will draw too heavily upon the sow. We often fail to get most out of the pigs by scrimping them during the first three or four months. If we could always remember that it costs less to put a pound of pork into a young pig than an older one, we might feed more liberally. They should not have more at a time than they will clean up. The troughs should not be allowed to get foul, and when nights are cool, straw enough for a good bed should be provided.—Farm and Home.

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Horse Breeding.

By Mr. J. Chibnall, Pt. Elliot Agricultural Bureau.

I have before me the Constitution and Rules of the proposed Horse Breeding Society as supplied to the Bureaux. When one analyses the conditions, etc., there is, in my opinion, nothing to be gained by the breeder. For instance, if a farmer puts two mares to the stallion, the cost would be £5 5/-, £2 12/6 each mare, whether they proved in foal or not, the ordinary insurance is better than this. If there was a refund in case of no foal there might be some inducement to breed under the Society's terms, as it now stands the man whose mares prove in foal and the owner of the stallion receive the benefit.

Rule 13 states that a committee may select a stallion of not less than four years old. I am quite sure that it is impossible for any committee to select a stallion suitable to all the mares nominated, whereas if several stallions are travelling the district a breeder can use his own judgment.

There is one point that must be considered if one is to become a successful breeder, and that is, that there must be selection of both the sire and the dam, in other points than mere size. More depends upon the selection of the mare than the horse and one point not to be overlooked is that really to improve the class of horse bred, it is necessary to obtain a sire that has the power of transmitting its individual qualities, as for instance, old Fireaway, imported by the late Mr. Grundy; a grand horse that stamped his brand on the produce of whatever class of mare he was bred to.

A special point to be considered in breeding is this, that for the production of a full formed, symmetrical, vigorous, and thrifty foal the mare should be proportionately larger than the horse, an overgrown stallion of great power serving a mare, in size somewhat less in proportion than himself, will beget a strong embryo that will require more room and more nourishment than the mare can afford and the result must be weakness and probably deformity, and almost inevitably failure in size, and probably the loss of the mare at foaling.

During a course of years the farmers in the north of England, to meet the demand for big draught stock, thought that by breeding their mares to the very largest stallion they would get this point without regard to the size of the mare, but the results were a lot of almost useless animals.

From observation I have come to the conclusion that when the mare is larger in proportion than the sire as a horse, the filly foals, provided all have fair play, will be bigger animals than the colt foals. These are the lines we should follow if we wish to get a good sound class of horse for the reasons I have already stated, that the mare being larger, has more nourishment and room for the foal whilst she is carrying it, and this rule stands good in breeding any animal.

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Some Facts About Horses.

About 40 per cent. of the weight of an ordinary horse is muscle. All muscles concerned with locomotion are attached to bones, and when they contract they cause the bones to which they are fastened to move. The lower part of a horse's legs are nearly all bones, but the muscles in the body and upper part of the limbs are attached to various parts of the body construction by tendons, and can thus produce a motion of the parts located some distance away.

The amount of motion produced by the action of the muscles, of, say, one of the horse's hind legs, will depend upon the length of the muscles and the length and the relation of the bones to which they are attached. The commonest idea among students of this subject is expressed in these words; "Long muscles for speed, short muscles for power." A long muscle enables a horse to get over the ground rapidly. A short muscle, however, is not powerful because it is short, but because in horses constructed on that plan the muscles are thicker, contain more fibres, all of which pulling together when contracted exert a much greater pulling force than a long, more slender muscle. It is because of this that in buying horses to draw heavy loads we look for large and heavy muscles, while in roadsters we must attach importance to the length of the muscles.

The most of a horse's muscle is in the hind quarters. This may be a surprise, but the next time you have an opportunity to see a horse pulling a very heavy load study him carefully. You will be impressed with the idea that most of the work is being done with the hind legs. When the hind foot is moved forward the toe rests on the ground and the leg is bent at the hock joint; if the toe does not slip, and the horse is strong enough for his load, the muscles above pulling on the tendon, fastened to the back and upper point of the hock, will close the joint, or, in other words, straighten the leg and cause the body to move forward. It is by the performance of this act at every step that the horse moves, although, of course, the strain on all parts is much greater when pulling very hard. This will also show the necessity of having large, broad straight joints and legs, that give the horse the most secure footing. You have probably also noticed when driving that many horses put their hind foot on the ground in front of the mark left by the fore foot and the faster they go the greater will be the distance between the marks made by the fore and hind feet. This shows that the length of a step is determined by the hind quarters; it also explains the need of large, strong hocks and legs that are not so crooked as to seem weak or so straight as to lessen the leverage afforded by this very wonderful arrangement of the parts.

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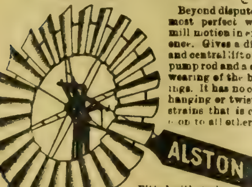

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Essentials in Sheep-Breeding.

A series of favourable seasons, of capital prices for all produce, and a consequent abundance of cash have done much of late years to arouse a spirit of enthusiasm among the numerous small flock-owners and farmers in this State. Scores of them have attempted to bring about some degree of permanent improvement in their flocks, and several have already met with an appreciable measure of success. The secret of effective permanent improvements in any flock belongs rather to the man at the head of it than to an indiscriminate expenditure of cash upon fresh blood. Successful improvement can only be established upon the foundation of some well-defined purpose, and unless the flock owner or manager knows what he is about, either or both had best wait until assured of the services of somebody who does. Too frequently where attempt has been made to establish some improvement it has been through the purchase of a ram or two from some fashionable flock, regardless of suitability. The owner must know in what particular direction he specially desires to establish improvements, and employ only such rams as possess marked evidence in themselves of the qualities to be strengthened in the progeny. Many flock owners in selecting rams for use upon their ewes rely too much upon outward appearance. In so doing they frequently make a big mistake, because the wool often has a deceiving quality. Many a ram on close examination will be found sunken in the wither and narrow-chested, though to all outward appearance there is no evidence of such weakness. It is impossible to judge a ram of any age by simply glancing over him. The ram is too important a factor, and has too great an influence on successful breeding of sheep, for any flock owner to employ its service without the most thorough and rigid examination. The ram is at any time a big half of the flock, and by being careless in this detail the quality of the progeny must more or less depreciate.

The secret of successful breeding of sheep is a gradual fixing of characteristics that improve utility. Improved blood is introduced into a flock for the express purpose of increasing the selling price of something. In the case of the merino it is expected from the wool, and in the matter of British breeds from the carcass. Many failures to effect any improvement are directly traceable to the owner not having any fixed purpose in mind in the selection of the ram, or rams, from which he seeks the improvement. The matter is possibly best illustrated by two examples.

The first example is that of a farmer in the Middle North, who keeps a large flock of breeding ewes and pays strict attention to raising lambs for the export trade. This man keeps none but merino ewes, Northern bred, and large-framed, and uses Shropshire rams. The great feature of this farmer's flock is the uniformity throughout his breeding ewes. The object this farmer had in view was a nice uniform lot of lambs fit to go into the market when mature and command top prices from exporters. He invariably commands top prices, and it is easy to see that his sucess has been founded upon some well-defined purpose.

The second example is an instance where the flock owner has followed haphazard practices. This farmer does not confine himself to any particular type or breed of sheep, but selects his rams indiscriminately. It is doubtful whether two individuals in this flock could be selected that would give any evidence of similar breeding. It was very noticeable that the larger portion of these ewes could not have carried much wool, or have yielded much profit from this source at shearing time. The lamb crop was equally unsatisfactory, partly on account of quality and partly by reason of the time lambed. The abovementioned two farmers furnish examples of two types of flock owners—one making a grand success of his sheep, the other more or less a failure.

Too many farmers are trying to make lamb and sheep raising profitable without any definite plan or purpose in managing their flocks. No flock owner can attain success in the breeding of lambs for market or of sheep for wool-yielding purposes who resorts to constant chopping and changing with no definite purpose in view. There are no well-fixed laws that can be relied upon to determine results of such a practice. Even the law that "like produces like" does not verify itself. The farmer who takes up sheep raising either as a speciality or as an adjunct to his farm operations should first decide upon the line of work he desires to pursue, and then unceasingly set about his duty. No matter what the aim the farmer has in view—wool, carcass, or lamb-production—successful breeding depends more on skilful management than on any other one thing.—Elder's Review.

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Flies and Horses.

The attacks of flies are a constant source of trouble to horses which are out at grass, and probably more particularly to the new-comers, who have not become accustomed to the persecution of these insects. Many remedies, such as a weak dressing of paraffin and water, sulphur, and the like, have been suggested as being efficacious, but they are practically worthless, as the chief centre of attack is the corner of the eyes, and naturally it is impossible to apply dressings to such tender parts. It is absolutely necessary, however, to either apply something that is effective, or else to bring the horse in if he has a broken wound or open sore about him, for if this precaution is not taken the flies will very soon magnify it into a possibly very serious form of trouble, which may lead to the worst possible results. As a general rule, it may be suggested that in the case of horses which are only enjoying a brief holiday out at grass it is the better course to pursue to bring them in during the heat of the day, and to turn them out in the evening until the following morning. Under such an arrangement the animal is protected in a great measure from the ravages of flies, and it is possible to ensure his getting a couple of feeds of corn a day, which will help to keep him in condition. He will also benefit by being exposed to the dew, which is beneficial to his feet, and at the same time renders the grass more palatable and nutritious.—"Exchange."

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If a horse is short-ribbed, he is light in his middle, and is nearly always a poor feeder. He has not the stomach to contain succulent food to serve him from one meal to another.

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Building Up the Cow's System.

It is well known by some dairymen who are considered good feeders, remarks 'The Canadian Dairyman, that it is necessary to feed a cow that has been in poor hands two years to get her system strengthened up so that she will be able to do her best work. She will likely give considerably more the first year of good feeding, but it takes two years to bring her to her maximum production. This shows that the milk does not come directly from the the feed, but as the energy is built up in the cow she is stronger and is able to do greater work.

Of course it is important that a cow should be fed well when she is producing, else she will draw more largely upon her bodily energy, and when she has depleted her system she will have to shrink in her milk flow. However, it is always injurious to feed a cow too much or overload her stomach. We want cows that are constitutionally strong, and we must do all we can by judicious feeding and care to keep the cow in as good fettle as possible.

But since with the very best care and feed we can give a good cow she will draw upon her system and deplete her energy it is necessary to have her dry long enough to replace this energy. It is because this is not done and cows are fed so poorly whilst dry that we see such poor results. There is no use of a man asking for a ration when a cow is fresh. A man needs to know how to feed her whilst dry as well as all the year round. The best way to teach is to know the tremendous energy that the milch cow expends in producing milk.

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Quality of Bone.

In judging the quality of bone one should take into account the character of the skin and hair overlaying it. If the skin be coarse and the hair long and linky rather than soft and silky, one is sure also to find excess of adipose and connective tissue about the legs, and this gives an appearance of round bone. Under such skin and hair one finds coarse spongy bone, so that where there is gumminess of the legs from coarseness of hair, skin, and tissue, the hoofs are likely to become correspondingly poor in texture and lasting capabilities. It is not so much great bone that we want to see in our horses. It is quality of bone, as evidenced by the character of the skin and hair alluded to, and then the flatness of the leg viewed from the side; and this is not due to size of bone so much as to great development and prominence of tendons which connect with powerful muscles placed where they are for the command and control of the levers or bones which they work. Depend upon it that if the hand can easily distinguish and separate the tendons at the back of a horse's legs, and can detect also fine hair and silky, pliant, thin, healthy skin, free from all gumminess, the bone is all right in quality, whether it be very large or apparently deficient in size. For wear and tear select the horses having the class of skin and hair and tendons we have described, and take it for granted that not only will the hoofs and bones be durable, but that the horse will be likely to possess much vigour and endurance. — Rural World.

◆

Calf Feeding.

"I have had some experience in calf-feeding that might be interesting to some of your readers, and if someone else has had the same trouble I would like to hear from him. When I first got my hand-separator, I fed the milk to the calves without taking the foam off; it would be 2 or 3 in. deep in each pail. I had three calves die with bloat. They would commence to bloat as soon as they drank the milk, and died in from two to three hours. As soon as I made up my mind that it was the foam that killed them I skimmed the foam off. Then I had no more calves die for about three months, when one of the men got careless, and went out one evening and fed one calf without taking off the foam; next morning it lay dead where he had fed it, all bloated. Since that we are very careful to take the foam off, as I feel very certain that it is the foam that kills them."—Wallace's Farmer.

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Lamb Marking.

An experienced stock inspector says: "I would strongly advise those who have lambs to mark to use the searing iron; the benefit of this method has been proved The lamb is not drained of its blood, and is consequently more fitted to withstand cold weather; the trouble from this is practically nil, and the check to the system is very much reduced There is no need to go to the expense of a searing machine. Any blacksmith could make the irons at a small cost."

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There is no age-limit fixed tha will apply to all dairy cows regarding their limit of usefulness One cow may break down when she is seven or eight years old and cease to be profitable, while another will last till she is 15 o 20 years old.

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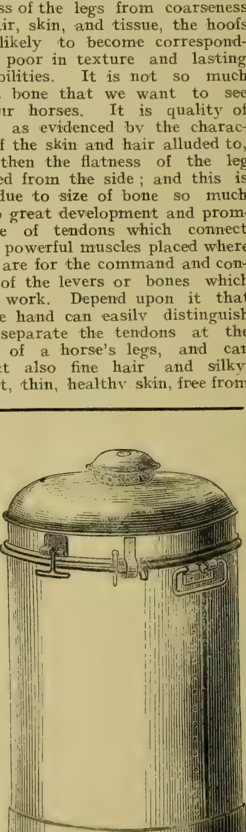

Milk Fever in Sows.

Sows have, by selection, been bred to an abundant milk production to supply the wants of the large litters which every breeder is trying to secure, and milk fever is by no means an uncommon disease, though the sickness of the sow is often attributed to other causes, and much valuable time is lost, during which the ailment progresses so rapidly that when treatment is begun it is too late, and the sow dies.

This disease is easily prevented by not allowing much stimulating food as a part of the sow's ration for a week or ten days previous to farrowing. A little maize must be given in cold water, perhaps, but an ear or two to a feed is sufficient, letting succulent vegetables with the addition of plenty of slop to which has been added a little pollard and scalded bran be the principal dependance. In cold weather all drink should have the chill taken off.

In warm weather, if the skin is not broken on the teats or udder, a hole for wallowing seems to be just what the sow enjoys, and plenty of pure water, with a cool place to lie and rest, is also essential. With these precautions one has little to fear.

The first thing to do in case the disease presents itself is as soon as possible to use a rectal injection of salts dissolved in warm water, or castor and olive oil mixed, either of these preparations to be injected freely, but slowly. If the sow is easily handled a physic may be administered as a drench, but if not, a pill containing from ten to thirty grains of jalap may be given. Some stimulating liniment should be applied over the loins, and a clean dry bed provided.

Of course, the pigs should be removed, so they cannot trouble the sow, but if she seems uneasy without them they may be placed where she can hear them, as this will tend to quiet her.—Colman's Rural World.

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The hen is a farm animal requiring but a small amount of capital on which to do business.

The value of a good horse is greatly enlarged by having a good form and striking appearance.

A horse that is to be used for driving or riding should carry no more extra flesh than is essential to plump muscles and strength, and it should have sufficient exercise each day to harden its muscles and give it good wind.

Lampas.

Lampas is a common disease among the horse stables, and the barbarous practice is that of operating with hot irons on the tender bars of the horse's mouth. This disease affects young horses before they have their full set of teeth. Young horses, changed from green pasture to dry, hard feed in the stable, are much troubled with it. The bars of the mouth will inflame, and the horses refuse to eat the feed. The treatment should be simple. Merely give soft feed, consisting of bran mashes, to keep the bowels open, soaked or scalded oats, boiled roots, etc., for a few days, and the trouble will generally disappear. It can positively be said that no other remedies need be used. In case of loss of appetite, use one teaspoonful to one tablespoonful of condition powder sprinkled over each feed. This will restore a vigorous appetite. Avoid burning the horse's mouth. It ruins the delicate sensitiveness to the touch of the reins so necessary in a pleasant, well-broken roadster. It often destroys the palate, and makes the horse a confirmed "wheezer." Burning is inhuman, and lessens the value of the horse, and it is unnecessary.—Exchange.

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The Ensilage Pit.

A dairyman, who believes in the ensilage pit, writes thus to the Leader :—"We advocate the silo because, in our experience, we have found—1. That we can never harvest a maize crop and get so much out of it at as little cost. Considering the ears alone, we never get as much milk out of them at as little cost as we do when put in the silo. 2. We never get as much out of the stalk as we do when it is cut just as the ear is glazing, and the whole, ear and all, put in the silo. 3. Cut at the glazing stage the stalk represents 40 per cent. of the combined value of both stalk and ear. Put it into the silo and you preserve that freshness and succulence all the winter. 4. It is a curious fact, but true, nevertheless, that the strongest opponents of the silo are the men who never tried it. Very rarely do we find a man who owns a silo who lets it get into disuse. The strongest advocates of it are the men who own one, who have fed it, and noted its effects on the cow. If the universal testimony of those who have silos is in favour of it, what more can be said?

The Dairy Cow.

A good dairy animal does not belong to any breed exclusively, but is found in all breeds. In experimental work it is found that it is not the breed that determines the value of a cow as a money-maker, nor is it colour, size, or her score on the scale of points of that breed. For the scale of points of the different dairy breeds is misleading; the cows scoring the highest are not necessarily the best cows. The score of a dairy cow should depend upon her ability to convert raw material into dairy products economically. Great dairy performers of all breeds have similar conformation. The first requisite of a dairy cow is large feeding powers. The more raw material she can make use of, other things being equal, the better the cow. An animal's feeding capacity can be closely ascertained by its conformation, it depending largely upon the size of the middle or barrel. The first and most important point in determining the size of the barrel is depth of body through the middle; then comes the length of the body from shoulder to hook points; and its breadth through the middle. A broad muzzle and strong jaw are also desirable—Farm and Home.

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The Value of Gruel.

A pailful of warm gruel is not only a great comfort, but a source of safety to many a tired horse which comes home wet and cold, and very possibly off his feed. It is far better for him, too, than the bran mash which some people erroneously prescribe in such cases, as it is more sustaining and not so laxative in its effects. Should, however, there be symptoms of the horse having contracted a chill a mash may be recommended him, and he should be kept in a warm, but not necessarily ill-ventilated, stable for a few days, during which time he should be watched to see how his condition continues. Sometimes if quite off his feed a horse will drink hay tea with beneficial results when he will not look at anything else. This can be made by filling a stable bucket with hay and adding boiling water. The mixture may be left to draw, with another pail or a thick cloth on top of it to keep in the steam, until cool enough to drink, and when partaken of will possess the advantage of at least being more nutritious than plain water.

The Jersey Cow.

— The "Rich Man's Plaything" and the Poor Man's Tool. —

When a rich man takes a notion to own a cow, he usually gets a Jersey, writes a breeder in the American Agriculturist. This practice is so common that the Jersey is often spoken of as "the rich man's plaything," especially by those who wish to cast a slur on the best of cows. Now I am perfectly willing to let it go that way. Rich men are generally men of good judgment, or they would not be rich. They are usually men of good taste, because they have had the training and associations to develop good taste. When such a man goes out to buy a cow he buys a handsome animal. He selects a nice fawn, a squirrel grey or a golden brown, because such an animal is more pleasing to the artistic temperament and looks better out in the park than one built on the startling checker-board plan. He selects the Jersey because he knows that she gives at least as rich milk as any other cow, and the rich man's stomach is called upon to hold so many good things that he cannot afford to fill it with three per cent. milk to filter out the little nourishment in it. He buys a Jersey because his business training has taught him that the thing that brings in the greatest results from the least expense to maintain is the most profitable.

If these things are true, why is not the Jersey cow just as good for the poor man as the rich man? The poor dairyman must necessarily spend much of his time with his cows. That in itself is a reason why he should own cows pleasant to look upon. Then again, if three Jerseys will eat no more than two of another breed, and yet produce just as much, animal for animal, is it not extravagance to feed to two cows that which should keep three profitable animals of another breed.

You say the Jersey is small and will produce but little beef, but please remember that it has cost no more to build up that frame pound for pound than it does one of the coarse dairy breeds.

About the only other libel against the Jersey is that she is "delicate"; that she will not stand rough usage and hardship. Well, that is not a very serious charge, for no sane man will ask a dairy cow to "rough it." But by "roughing it" I don't mean that she cannot go out on the hillsides and pick her living—for she can. She is quick and nervous, and she will pick her living from a pasture where one of the clumsy, coarse-made, sluggish dispositioned cows would starve. As proof that they are a healthy breed, I will wager that you can find more old cows in the herds of Jerseys than in any other breed. I owned one imported cow until she was 19 years old, and I often find that my cows do their best work after they are 10 years old.

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Oats and Milk.

Commenting upon the subject of the improvement of milk by giving a judicious amount of oats to cattle, one of the Danish daily journals recommends the giving of oats in small quantities when the milk is watery, adding that about 1lb. to ¾lb. would be sufficient per head per day. This, the authority in question states, might be accepted with a certain amount of hesitation had it not been proved in a definite manner by experiments that a supplementary ration of a little oats has a very favourable influence, not only upon the amount of fatty matter, but also upon the taste of the milk and the butter made; moreover, there is an increase in the production of milk and butter in consequence. The foregoing contention is supported by an experiment which was made on ten cows, divided into two groups of five each, in such a way as to ensure that their milk-production was almost identical. After a certain day the first group received, as a supplementary ration, about 1lb. of oats per head daily. Even as soon as the second day the favourable influence of this method was apparent, for an increased yield of milk was given, which lasted up till the tenth day. This milk was very good, having a fine nutty flavour; the butter was better, and the cattle in good condition.—Leader.

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Weighing the Milk.

It is not so much of a job to weigh the milk of each cow. It is not necessary to weigh it every single night and morning, although it is better to do so. It does not take very much time, with a pair of spring scales and a sheet of paper properly ruled, with the number or name of each cow. It takes only a moment's time, after you milk the cow, to hang the pail on the balance and make a record of the weight. For practical purposes I say it is not necessary to weigh the milk night and morning. You can weigh it one day in the week. Select one day in the week, and then weigh the milk of your entire herd on that day and make a record of it. At the end of the year you have approximately the number of pounds of milk that each cow has given. Then take the one day in each week, multiply the weight for that day by seven to get, approximately, the yield for the week, and work out the record in that way. You will be surprised to see how close you will come to the actual number of pounds of milk each cow gave.—Professor Lillie, in Michigan Farmer.

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Ensilage for Dairy Cattle.

(Continued from page 214)

— Differences in Silage. —

While the science of ensilage making has so far developed that the process under ordinary conditions presents very little uncertainty, there are still some variations in the general quality obtained in the product that call for some comment. The making of sweet and sour ensilage in various degrees, and the loss in some cases of a small portion of the fodder that is adjacent to the silo wall, have both given rise to much difference of opinion. This science of ensilage making has developed during the last decade to such an extent that the terms sweet and sour silage as we know them now have not at all the same significance as they formerly possessed. In the early years of ensilage making there were only two kinds of silage recognised, sour and sweet; and of these only the sour was suitable for fodder. What was then known as sweet silage was the discoloured and partly decomposed material which from exposure to the atmosphere had lost its acidity, and its usefulness as fodder. More advanced knowledge of this work has however resulted in the making of a much better quality of ensilage at this present date; and that even to the extent of rendering the one-time best sour silage now only a second class product. There are now three definite stages recognised in ensilage making, and the quality of the product varies in accordance therewith. These are malting, acid fermentation, and decomposition. Silage fermented only to a stage short of souring or acid formation is known as sweet ensilage. When acidity has developed the product is classed as sour ensilage. The decomposed material (the old-time sweet silage) is recognised as such, and should be regarded as of inferior quality. A farmer producing silage of this description should make up his mind to do better next year.

— When to Cut. —

A crop in its most suitable stage—that is when it is approaching maturity—if it is properly dealt with, will make into a first class ensilage. Both its flavour and aroma will be such that it is easily distinguished as sweet silage; for in it fermentation has not developed to the stage of acidity. Dr. Cherry definitely states, that the lower maximum temperature obtained the better quality will the ensilage be. A minimum of heat from fermentation will be obtained when the crop being dealt with is approaching maturity; for there is then a small proportion of the plant cells in the active or living stage; and it is under these conditions that sweet ensilage—the best ensilage—is made. With the higher and longer sustained rise in temperature more or less acidity is developed in the ensilage; and as this change, which is patent to our observation, is also a chemical change that alters the composition in the direction of reducing the feeding quality of the material, the production of sweet ensilage is the more economical. The souring of silage may arise from several causes, such as from ensiling the fodder in a too immature stage; from too quick filling; from the material not being properly tramped or packed in; or from other cause that may increase the temperature in the silo—a high temperature being the antecedent of development of acidity. In general practice it has been found that about six feet is a sufficient depth of material to fill into the silo each day if a minimum temperature is to be maintained; a greater depth tending towards increased heating.

— Prevention of Waste. —

Where any decomposition occurs near the wall surface of a silo it is usually the result of want of care in filling; this being the place where the work of tramping or pressing down is usually most neglected. If the material is not tightly packed at the wall, air must gain access to the adjacent material, and some loss will result. If the walls of the silo were constructed of particularly porous material, such as soft brick, and built above ground, a little loss might occur over the whole wall surface; but the porosity in such cases could usually be checked by the application to the inner wall surface when the pit is empty of a cement wash or a coat of hot tar, to which pitch has been added at the rate of 1lb. to the gallon. In the filling of a silo a very heavy pressure obtains on the wall surface; but with the cooling and settling down of the mass this pressure diminishes, till the material becomes a solid body more or less independent of any support. When this has taken place any carelessness in filling that has allowed of the admission of air between the silage and the wall will be followed by the decomposition of some material at that place.

— Opening the Silo. —

In opening the silo, and using the ensilage, the same principles must be observed as in filling and closing it. The required quantity should be taken off evenly and regularly from the top of the silo; and, if feeding the ensilage should be stopped for even two days, what remains in the silo should be as carefully covered again as before. The using of the fodder from the side surface of a bush silo is also undesirable; and should not be attempted unless all that is in the pit is certain to be used without a break; for it is almost impossible to cover up a side surface if once exposed; and moulding and decomposition of the exposed silage will result.

— Planting Operations. —

To clean ground fouled with weeds without loss of time there is no more profitable way than to make a sowing in the autumn of mixed fodder such as peas and oats, or rye and tares, for green stuff; and then to follow it up, when harvested, by a maize crop with summer cultivation. The green stuff should be harvested for ensilage before the weeds have seeded out; and, under the fermentation in the silo, the germinating power of all weeds is destroyed. If the maize is then sown in fairly wide drills—as it should be, in order to obtain a plant rich in feeding value—and the intervening ground kept well stirred throughout the summer, there should be very few weeds to interfere with a succeeding crop.

— Summary. —

The advantages of having a quantity of green fodder chaffed and stored as silage for winter use are many and obvious. To have to go to the field for a load of fodder and get it into the mangers on a wet day is a task under any circumstances; and when the ground is soft or when the horses are required for other work it is very satisfactory to know that the cows can be well supplied with little labour from a store of succulent fodder close at hand. The possession of an ample supply of ensilage unquestionably makes towards improved dairy returns, while also allowing of the general work of the farm being more systematically and expeditiously carried out. Succulent fodder practically insures a good milk yield; and only in very exceptional cases can this be obtained through the autumn and winter months without the use of the silo.

The Advantages of Cross-Breeding.

There is an old saying that the first cross between any two established types of cattle is always the best. There is any amount of evidence in support of this visible among the cattle from Queensland and the Far North which find their way as fats into the Adelaide yards. The most general example in support of this saying is the first cross between Hereford and Shorthorn. For frame and weight these results justify the argument; but equally true is it that the next step at crossing is one which presents difficulty.

While cross-breeding has been advantageously and extensively developed in every cattle-raising country in the world for the production of beef, it seems somewhat strange that the process has been utilized to only a very limited extent in connection with dairying pursuits. What the crossing system has been the means of effecting in promoting economic production in respect to beef is abundantly illustrated, not only in the fat-stock yards, but also at almost every fat-stock show in Australia. In a numerical and mereitorious sense the crossbred results, i.e., the first cross of two pure breeds, surpass those of the individual pure breed, while in average weight they are usually at or near the top. If the crossing of two distinct varieties can be effectual in yielding such gratifying results in the production of high-class beef bullocks, it is surely feasible to think that the system might be applied with similarly beneficial results in the production of profitable types of dairy cattle. There is just as ample and good a selection of parent stock in the one case as in the other. For instance, the shorthorn is as valuable for milking as for beef production, and consequently the cosmopolitan variety may be as successfully utilized for the one purpose as the other. The Field goes to some pains to show that a preponderating proportion of the British dairy cattle are Crossbred Shorthorns, and proceeds to argue that they are virtually pure-bred specimens in themselves, for if they are not registered, or technically eligible for registration, they are descendants of families or strains of long standing, and are thus pedigree animals without a place in any herd-book. In many of these ineligible herds the same periodical states that the ancestry is more exclusive and of longer standing than that in some prominent pedigree herds, and that, speaking generally, it may be said that the so-called non-pedigree Shorthorns are exclusively of the cosmopolitan order.

Although this animal is a highly profitable dairy cow, milking liberally, and producing a good calf, suitable, according to the breed of the sire, either for milk or beef production, it is conceivable from a milk point of view that further improvements might be effected by crossing again with one or other of the special dairying varieties, such as the Ayrshire, Jersey, or Guernsey. At all events, if the result reflected no direct credit upon the Shorthorn type, such crosses might profitably supersede the hopelessly mongrel dairying breeds which are peculiar to so many localities in this State, those brown, brindle, blue, and generally parti-coloured animals which so effectively scare dealers, graziers, and even butchers. They would probably not be so handsome as the pure type of any of these breeds, nor perhaps would they surpass the pure-bred cows in their milking performances, but they would certainly be superior in breeding a class of calf adapted for grazing purposes, while the cows themselves would be of superior realizing value when they had served their full period of usefulness in the dairy. In the absence of definite results the particular cross that would seem to suggest itself as likely to yield the most satisfactory results would be the Shorthorn and Ayrshire. These breeds are less dissimilar than the Shorthorn and either the Jersey or the Guernsey, and it seems highly probable that the crossing of these two would result in the evolution of an animal valuable for both milking and grazing. Strange to say, at one September Show a bull which was awarded championship honours as an Ayrshire was a cross between an Ayrshire and a Shorthorn. This was subsequently established to

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REINS, Single Cart, strong, 7/6, 8/6; Spring Cart 7/6, 8/6; Leading, 11/6 for 25 feet, 16/ for 36 feet; Cross Reins, strong, Waggon, 12/6, 13/6; Cross Reins, Buggy, Silver Buckles, best 14/6, 15/6. For folded hand parts add 6/ Bridle Reins, 2/6; Silver Buckles, 3/6.

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the complete satisfaction of all parties concerned, including the judges. Whether all Ayrshire bulls are as prepotent in their influence as this particular sire, the writer cannot say, but the result was such as to deceive expert judges into believing this first cross to be a pure-bred Ayrshire. The only material risk that would seem to ensue from such a cross would be the production of milk of inferior quality. Both breeds are deep rather than rich milkers, and it is just possible that this characteristic would be accentuated in the progeny.

Although there is little authenticated evidence to go upon regarding the probable results of cross-breeding for dairying purposes, there is in the records of the London Dairy Show some amount of data of a distinctly encouraging nature. For example there is an instance of a remarkable old cow, a cross between a Shorthorn and a Jersey, which can show a record of achievement unequalled, either in eminence or duration, in the annals of any Show. If this extraordinary animal, which at the age of 24 years won the first prize in a butter test, is any indication of what might be achieved by the crossing process in the production of milking stock, there is substantial inducement to prosecute investigations in this direction. In New South Wales the Shorthorn and Ayrshire breeds have long been crossed, with the most satisfactory results, it being claimed that the milking properties of the one and the grazing qualities of the other have been appreciably improved in the resulting cross, which has now come to be recognised as a distinct breed. The crossing system might have other beneficial effects besides strictly utilitarian. For nstance, it is generally recogniz that the fusion of two distinct strains of blood has a tendency to strengthen the constitution, and in this way a hardier and healthier race of dairy cows might be reared and maintained by crossing the Shorthorn with one or all of the purely dairy varieties.—Elder's Review.

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A cow will not, of her own accord, move so quickly as to impair her milk flow. It is when she is "rousted" by a dog that the trouble occurs.

A light-centred horse seldom weighs well, and weight in a draught horse, if it comes from bone, sinew, and muscle, goes a ong way to determine his commercial value.

Size and Milk-Yielding.

Size has little to do with the milk-yielding capacity of dairy cows, as equally good milkers are met with among both large and small dairy cattle, and in this respect, therefore, neither class of cows can claim any superiority over the other.

Taking the case of a large and small cow, both of which yield an equal quantity of milk during the year, the latter is, of course, the more profitable one as a milk-producer, seeing that her cost of keep is less. Large cows, it need hardly be said, eat and require more food than small ones, and for this reason the former must yield a larger quantity of milk or butter than the latter if they are to be equally profitable dairy cows.

In order to make a satisfactory comparison between the respective merits of large and of small dairy cows as milk or butter-producers, the yield of milk or butter per 1,000lbs. live weight in each case must be compared.

Although small cows consume less food than large ones, yet the former eat a larger amount of food in proportion to their size or weight than the latter—that is to say, the quantity of food consumed per 1,000lbs. live weight is greater in the case of small cows than it is in that of large ones.

Large-sized dairy cows undoubtedly are much more in favour among the generality of dairy-farmers than small ones, the reason being that the former are more saleable than the latter when they cease to be sufficiently profitable as milk-producers. It should not, however, be overlooked in this connection that it is not mere size but rather beef-carrying capacity which enhances the value of a dairy cow when her milk-yielding days are over. A big-framed cow is not necessarily a good fattener and beef-producer, although size is more often than not looked upon by the dairy-farmer as being equivalent to beef-making qualities in the case of dairy cattle. Aptitude to fatten and beef-carrying capacity are dependent not upon size, but upon shape and breeding. As it happens, most large dairy cows prove to be good butchers' beasts as dairy cattle go, because they are either Shorthorns or Shorthorn crosses, as a result of which both their shape and their breeding are favourable to the production of beef. The majority of small cows, on the other hand, make poor butchers' beasts, on account of neither their breeding nor their shape being conducive to the laying on of flesh and fat and the production of a useful butchers' carcass, quite apart from the fact that they lack size.—Farm and Home.

◆

Colour in Horses.

It is generally considered that any coloured hair may cover a good horse but the Arabs of the Sahara attach great importance to the colours of their horses. All light and ill-defined colours are regarded as bad, whatever the conformation of the horse. Very dark chestnut is thought to denote speed, and this colour, also dark-bay and black, are most esteemed as indicating speed, courage, and staying-power. Grey is thought handsome, but does not indicate a good horse. The Arabs say of the grey that "in the sun it melts like butter, and in the rain like salt." Dun and roan are regarded as inferior, and a piebald or parti-coloured horse is the least desired of any. "Avoid the piebald like the plague," say the Arabs; "he is brother to the cow."

◆

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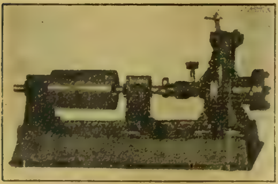
Sidebones.

All breeders, buyers, and sellers, should know what a sidebone is and how it should be detected. Stand with the back to the horse's head, lift up the near fore-foot with the left hand, and with the fingers and thumb of the right hand take hold of the side of the coronet (hoofhead) at the heel. At this part there is a ridge of elastic cartilage in sound horses, and it should be possible to bend it from one side to the other.

This is called the "lateral cartilage," and its purpose is to spread the heels apart and distribute concussion so that the leg above is not jarred in a damaging way. When this cartilage has turned to bone it is termed a sidebone, which may be on one or both sides of one or both fore feet.

Standing the other way and running the palm of the hand down over the coronet a marked or large sidebone may be detected as the thumb on one side and the forefinger on the other side meet it as a hard, rigid, bony enlargement. Both methods of detection should be employed in examining a horse, and horses having one or more sidebones should be rejected as unsound.

Lameness is usually present when a sidebone is forming, and when complete it so interferes with action that the animal is straight, stiff, and stilty in front, and often lame on hard pavements or roads. As sidebones are usually most prone to form on shallow, weak feet, or on box, mule-like hoofs, they should be most suspected on such feet, and animals having a tendency that way should be regarded with suspicion if intended for city work, while stallions should be rejected if there is a sign of sidebone, as the conformation favourable to the appearance of sidebones is at least hereditary, and so transmissible to progeny.



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◆

Brushing in Horses.

The fault of brushing and speedy-cutting, which are such common defects in the action of horses, vary in seriousness in different cases. Many horses brush only when they are tired out or when they are weak and not in a fit condition, and in this case the fault need not be looked upon as being very serious. But when a horse brushes habitually and constantly then the fault is very serious. Among horses that brush some do so only when going at fast paces, and not when they are walking, while others will brush when moving at a walking pace, as well as when trotting or cantering. Some special method of shoeing may in certain cases be effectual in preventing a horse from brushing to a great extent, but in the majority of cases this fault cannot in any way be remedied by shoeing. The fault of brushing is not at all uncommon among young animals which are green and unmade; in their case it is usually due to awkwardness of gait and weakness or want of control over the movements of the limbs. In these circumstances no importance need be attached to the fact if the position of the limbs is correct and the action is satisfactory. The fault will disappear when the animal gets into better working condition, and when it becomes more handy in its action.—Exchange.

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Ailments in Pigs.

While a sick pig is generally hard to cure, says a writer in the American Swine Herd, there are many remedies prescribed for pig ailments. I have only one remedy for a sick pig, and it is a very simple one. Rheumatism, paralysis, blind staggers, thumps, scours, etc., I treat all alike, though in varying proportions. My cure-all or panacea is nothing more than fresh new milk and turpentine. For a young pig, say, six weeks, I administer a teaspoonful of turpentine in, say, half a pint of milk. Unless the pig is very sick it will readily drink this. If too far gone to drink it must be administered with a spoon. An older pig, however, will seldom refuse new milk, even when a tablespoonful is given in a quart or more. I always keep a supply of turpentine on hand, and when there is anything wrong with the pigs at once give a dose of turpentine and new milk. It is the best remedy I know of for all the ills that pigs are heir to. Grade the dose from a teaspoonful for a six weeks' old, to a tablespoonful or more for a mature, pig. The milk may be given ad libitum, or as much as the pig will take to drink freely.

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Nail Pricks.

It has long been known that nailpricks and other similar injuries in the horse's hoof may lead to an infection followed by the formation of pus under the horn of the hoof, and a serious general disease of the horse, or, at least, the loss of the hoof. In a bulletin of the South Dakota Station Professor Moore has recently reported results obtained in a number of cases from applying a strict antiseptic treatment to injuries of this sort. The method consists in paring away the horn of the hoof from the affected part until the blood oozes out. The hoof is then thoroughly washed in a solution of bi-chloride of mercury, at the rate of 1 part to 500 of water, after which absorbent cotton, saturated in a solution of the same strength, is applied to the wound, and the whole hoof is packed in cotton, surrounded by a bandage, and well coated with tar. This prevents any further filth from coming in contact with the wound. The operation must usually be done by a qualified veterinarian. Subsequent treatment, however, can be applied by the average farmer, since all that is necessary is to pour a little of this solution of bi-chloride of mercury upon the cotton which projects from the upper part of the bandage. The cotton will absorb enough of the solution to keep the wound moistened and hasten the healing process. If a remedy of this sort is not adopted in the case of foot wounds in the horse, the owner runs considerable risk of serious infection, either of blood-poisoning or lockjaw.

Poultry Notes.

The Egg and Its Formation.

Every person, whether they be poultry-keepers or not, are familiar with the outward appearance of an egg, but how many are conversant with its formation? The egg itself is enclosed in a shell, which is composed mostly of carbonate and phosphate of lime, and when we come to consider that one hundred eggs, weighing two ounces each, contain more than twenty ounces of lime, we shall be able to see that the hen must consume a large quantity of these lime compounds in order to provide the necessary material for her yearly production of eggs. If this amount is not forthcoming in some form or another, then the hen will lay what are termed "soft-shelled" eggs. Of late the idea has been put forward that shell-grit or any other kind of lime substance need not be given to the fowls, as there is sufficient shell-forming material contained in the food they eat; but experiments prove that hens, without resource to these substances, lay a larger percentage of soft-shelled eggs, and a smaller quantity of eggs yearly, than those which continually have it before them. The shell of an egg is porous, being perforated by hundreds of minute holes, through which the air is able to pass, and when seen under the microscope it appears like a sieve. Owing to this fact evaporation of the contents is constantly going on. It is on this constant evaporation that the well-worn discussions of "What constitutes a new-aid egg?" have been based. The whole point of preserving eggs also depends on the covering up of these small holes. Whether lime-water, varnish, water-glass, or any of the other methods be used, the idea is to completely stop the air from getting to the contents, thus preventing any action taking place.

In the interior of the egg and adhering to the shell is a thin skin, known as the outer membrane, and fastened to this is another skin, known as the inner membrane. These are attached together, excepting at the broad end, where they separate to form the air space. The white of the egg, which is in three layers, is composed of albumen. The yellow, or "yolk," is also enclosed in a membrane, and is composed mostly of albuminous matter, organic salts, phosphoric acid, and colouring matter. Many people imagine that the chick is formed in the yolk, but this idea is wrong, the chicken being formed from the white, the use of the yolk being to provide nutriment during the stages of development and during the first thirty-six hours after its exit from the shell. Joined to the membrane enclosing the yolk are two pieces of thickened albumen, known as the chalazae. The purpose of these is to keep the yolk in position, and to act as buffers for it. Many people possess the idea that they have something to do with the germ of life, but this is erroneous, the germ of life being almost invisible.—Exchange.

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Feather Eating.

This is one of the worst vices that can be found in a poultry yard. The mongrel class is the most prone to it, then the light breeds, and the least affected are the heavy breeds. The vice seems to run in the strain, and it is a common thing to notice chickens doing it. With hens it usually shows up at moulting time, and it is a most difficult disease to cure. It is most commonly found among birds confined to small runs, where they have no occupation or anything to keep them busy. Birds having a free run are much less affected, as they have so much diversion and exercise in scratching round for food. Where birds are confined the floor of the run should be covered to a depth of 6in. with a litter of grass, straw, or any other suitable material. The grain should be thrown in this litter and well raked over. If this is done in the morning, the fowls are kept busy throughout the day in scratching for their living, and so are less liable to indulge in any tricks. The ground, too, should frequently be turned over for the same reason. Meat buried in the ground will soon produce maggots, and thus give the hens something to do in picking them out. A cabbage suspended about 18in. above the ground will keep them exercised all day, and a liberal supply of meat will lessen the desire to peck out feathers. The habit is set up through the fowls finding out that the butt of the feather contains blood, and so many people argue that plenty of animal food will supply the craving and so knock the desire out of the bird. Another cause is supposed to be the irritation set up by insects at the base of the feathers, which causes the hen to peck at the spot troubled and so contract the habit; but most cases occur where the culprit eats the other hens' feathers. Many methods of curing the disease have been tried, but none is thoroughly successful. The best cure is exercise and suitable food, and if these fail the bird should be killed, as it is a vice that is quickly learned by the other fowls.

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Chicks that show leg weakness are seldom cured. It is a harsh remedy for their distress, but death is sure to come to them, and the sooner they are put out of their misery the better.

Chicken Feeding.

The following methods of chicken feeding advocated by leading English poultry breeders serve to show that there are many ways of reaching the same end.

Mr. Arthur Little, the Langshan man, writes :—Having tried both methods, I am decidedly in favour of dry food for young chicks—i.e., for about the first six weeks only —subsequently a judicious combination of dry and soft food is preferable, to ensure good growth and early maturity. The advantages of dry food are many, the disadvantages, as far as I have experienced, nil. If you wish—and we all do—healthy, active, hardy, young chicks, by all means adopt the dry-food system. My method is as follows:—For the first thirty-six hours after hatching no food at all, then some small grit and granulated charcoal, followed by dry pin-head oatmeal for the next thirty-six hours ; after this a good chick feed, which contains a good amount of millet and canary seed, added to which some high protein beef scraps (size to suit the chicks), each feed buried in fine cut chaff, or, better still, refuse from the threshing machine. The exercise the chicks enjoy in scratching for the feed is one of the chief advantages of this system : it promotes health by quickening their circulation, developing their muscles, and keeps them occupied and contented. After six weeks gradually work in one light meal of soft food a day, increasing this the following week to two, and then later to three, but only sufficient to slightly appease the appetite. This helps on the growth. You will find that chicks fed on dry food alone will not make the same growth that those do which are fed on a combination of the two after six weeks old. There is one matter connected with dry feeding which requires special attention : a supply of clean water, or, preferably, milk (the latter must on no account become sour), should always be kept before the chicks, and also a good supply of chopped green vegetables should be given, lettuces, onions, grass, clover, and dandelion leaves being the best. One of the advantages of dry food is that a supply can be buried in the litter in the evening, ready for the chicks to set to work scratching at dawn, and so get their food at once instead of waiting and worrying for it, as they so often have to do when fed with soft food ; another is less labour and time spent on feeding by the attendant; yet another, and an important one, is freedom from bowel troubles. This last is one of the great disadvantages of soft food. In many cases the attendant is not over-careful as to the manner in which it is prepared ; it is often mixed too wet and sloppy, thrown down, and trampled upon by the chicks into a dirty mass, while some is left to rapidly become sour, and subsequently eaten by the chicks with obvious results ; therefore, I repeat that for very young chicks dry food is infinitely to be preferred, and later a combination of dry and soft.

Another equally successful breeder maintains that the best plan is a judicious combination of the two methods, for used rigidly by themselves neither of these systems of feeding is wise. The best plan is a judicious combination of the two, and other circumstances, such as natural or artificial mother, the time of year, the scope for securing a supply of animal food by foraging, and the ultimate destination of the chicks, whether for table, early laying, or next season's stock, should all exercise some control over the method of feeding. In the early spring the combination I have found most successful in raising robust youngsters when reared artificially is to feed for the first three or four days entirely on dry chick-feed, and give constant access to water. After this a small portion of soft food, made up in one or two pyramids—resembling somewhat the French feeding-stick system—is placed in each run for the inmates to help themselves from, and is left there, if not all eaten, till mid-day. At the beginning they are rather shy of this, but once the taste is acquired they worry round it for a long time, and load themselves with a feed of good stuff to start the day on. No other meal of "soft" is given, but the quantity put down is increased as their capacity enlarges. The rest of their sustenance they derive from dry food, and what they get in the way of plant growth and the small captures they make of insects foraged out in their wanderings. If they are not able to secure the latter a little meat should be incorporated in the soft food, as it is a necessity in the diet of such a mixed feeder as a chicken. The mash food I use is the same as I give to the adult birds, and more often than not consists of table waste, well boiled and stiffened with sharps and ground oats to a crumbly mixture, not pasty nor yet too harsh. Feeding thus, I find I avoid some of the ills that chicks seem to stumble on. The great and pleasing feature is that the dirtiness behind, which seems to be a fate with youngsters fed too largely on mashed materials, is escaped, and the unpleasantness and insanitary conditions that this trouble gives rise to are practically obviated. The all-dry diet, if exclusive, or kept on too long, especi-

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ally in a rearer with limited run, leads to irregular bowel action, and frequently occasions excessive thirst, followed by death.

With regard to rearing for table purposes one authority writes :—"Living in a county as I am, where so many thousands of early spring chickens are reared, I have the better opportunity of judging as to the results of feeding than some people, perhaps, and I am well aware that it does not pay to bring chickens up on dry food if one is making a point of rearing for the early market, for the chicks do not grow so fast, and, what is, perhaps, more important still, they have not that soft, white appearance of flesh when fattened if they have been fed upon grain during the time of rearing. The yolk of the egg is the natural food for the chick when newly hatched, and the closer we stick to the laws of Nature when rearing chickens the better results may we expect. If dry food was intended naturally for chickens, Nature would have placed some dari, buckwheat, and other hard grain in the egg, so that the chicken could have absorbed this before emerging from the shell. No, sir ; dry feeding for young chickens is a capital plan for lazy people, because it saves in two ways. First, it does not take long to feed a batch of chickens ; secondly, after a few weeks there are less birds to feed. I should like to hear of anyone bringing up a batch of chickens, and getting them ready for the fattening pens in twelve weeks from the date of hatching, as is often done in this county with soft food. I worked some experiments last season with two batches, of 100 chicks in each, with the result that the soft feeders were ready for cramming a month before those which had been on grain.

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Turkey Breeding.

Turkeys are among the most profitable things the farmer can rear under good conditions. To get a start only purebred stock should be selected. Choose the heartiest, most vigorous birds of the Bronze variety. They do not develop until about 2½ years old ; still the young toms, if well fed will dress at six months as fine and look as good as small breeds and will weigh from a third to a half more. Get a tom and two or three hens as a start, or at all events get a pure bred male, not too large for the hens, and grade up the flock. The first year may not equal anticipations, but a good flock can be raised with care. Young birds must be given attention for the first two weeks, but after this, the work will become lighter. When they are two months old, they will take care of themselves, but for best results, they should even then be regularly fed at night to make them come home to roost.

If I were to start in the business of raising turkeys, having the experience I now have, writes an experienced breeder, I should purchase three or four of the best females I could find that were near standard weight and as nearly perfect in color as I could find. I should also buy their sire if he had proved to be a good one, and should mate them to him. If I could not get the sire, I should get a cockerel from the same mating that the females were from, and should mate him to the females. Then I should save the eggs from the best hen, mark her poults, and save a tom from her to mate with my flock the next season. The pullets I should take to another farm and mate to a tom from the home flock. In that way I could line-breed and not in-breed too closely. When I saw there was need of new blood I should purchase a female from the breeder of whom I purchased my original stock, and in that way I would keep the same strain ; but my birds would not be near enough related to affect their health and vigor. As surely as you introduce a new strain in your flock, you will lose both shape and colour, and it will take time get back where you were when you made the cross.

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The Sitting Hen.

The broody hen is not defunct yet, but incubators are splendid things to have about a yard, and one at least is almost indispensable even for the breeders who use broody hens. In case of any obstinacy on the part of a hen, if an incubator is running the eggs can be placed in it and saved. Again, those who prefer broody hens admit that in the third week of incubation the eggs will do quite as well in an incubator, and so a hen after being set a fortnight can be started again on a new batch of eggs.

There are a few essentials for success in natural incubation :—

(1) Extreme quiet. A hen at this time of year does not take to sitting well where there is not perfect repose. She has not that consuming desire to sit that overcomes her in the warmer weather, so she must be humoured a little. It is therefore better to set her so that she is not within seeing distance of another incubating hen.

(2) Set her on the bare ground, the nest being padded saucer fashion with soft earth, so as to form a slight basin wherein to hold the eggs. This should be rammed fairly hard or the eggs may sink into it. Sprinkle all over with a little straw or hay chaff, or hay itself. Straw is rather hard.

Lift her carefully off every day. Take her by the wing at the shoulders. Thus there is no chance of her holding the eggs under her wings and suddenly dropping them, to their damage. She may not eat every day, but she will drink and relieve herself. That is all that is necessary provided she eats plentifully sometimes. Do not leave the hen to come off and go back of herself. It is a bad plan. Examine the eggs about the tenth day, and reject the clear ones. Do not disturb the hen the last two days. Do not feed the chicks the day of hatching. The yolk supplies all they want for 36 to 48 hours.

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Poultry Industry for Women.

Last month we printed some notes about the Coaley Poultry Farm sent us by Mr. J. J. Gabb. The following is a summary of a paper on the merits of poultry breeding as an occupation for women, read by the owner of the Coaley Farm.

The advantages to women who take up poultry-breeding and selling the products are summarised by Miss Edwards as follow :—

1.—It is work for the woman at home.

2.—It offers openings for women in both public and private appointments.

3.—It affords advantages as a business in table poultry and egg-production to the daughters of farmers and of clergymen, or others who have land at their disposal.

4.—It can be made a successful financial business by women who take land solely for the work of fancy and utility poultry-breeding.

Of late years, as we know, the tendency has been for women to seek employment in factories, offices, and shops. And the inroad of women for city employment has been, and still is, steadily increasing. The sedentary employment enforced upon women by city employment must be a factor in the production of nerve complaints, and in inducing physical deterioration. It is not natural that women should be shut up as is imperative in offices, shops, and factories. It cannot be healthy, nor can it be wholesome, whichever way it is looked at. Their home, under such circumstances, is no home. It is merely a boarding-house. Look at the streets, which, night after night, are thronged with the girls and women that are pent up each day, with few holidays during the year. It is their only opportunity of getting a breath of comparatively cool and fresh air. No doubt this life of the female city-worker may be bearable and even pleasant to those of them who give no thought to the morrow. That morrow, however, comes. It will not be all cakes and ale when age or illness arrives, and they are thrown on their own resources without kith or kin to care for them. Such city-workers will not have provided much in the stocking for the inevitable rainy day.

As the average city-worker is no homebird, the chances are that she will have to face life alone, for what sensible man would want a wife whose idea of pleasure is to gad about the streets?

How much better is the girl or woman circumstanced who finds her best life in her home, and with those about it. With an acre or two of ground, devoted to poultry and bees, a woman would be able to earn more than one placed in an office or factory, and who, at every turn is led into expense. And then, how wholesome-looking is the woman who spends her time working about in the open. There is no comparison between them. The one may look a bit smarter than the other ; but we may presume that skin-food and face-wash shops are not kept open without customers.

Miss N. Edwards wrote the paper referred to from her practical knowledge. One branch of her business, i.e., the breeding of fancy and utility poultry, has been followed by her for 13 years. Her sales consisted of newly-hatched chicks, sittings of eggs, pure-bred birds for stock, exhibition, and export. After the close of each hatching season the fresh eggs were sold, if prices were high, and if low they were preserved in waterglass, and were then sold in winter at a good profit.

One of the chief sources of income to poultry breeders in Great Britain is the sending away to very long distance (distances that would take a couple of days' travel) chickens just out of the shell.

In bringing this comparatively new phase of poultry-breeding before women let Miss Edwards herself speak :—

"The stock selected with which to start should be one or more of the most popular varieties, birds with useful qualities, and those most in demand for this kind of business are good layers and good table-birds combined. The use of trap-nests is indispensable to determine the best layers and to know the progeny of the prize-winners. It is desirable to specialise in one or two varieties, rather than to keep half-a-dozen when starting. The trade now done in England in newly-hatched chicks is extensive. This system originated in France, and twenty years ago was but little known in England. Chicks are frequently booked for dispatch long before they are hatched, and only the most reliable incubators should be used, or disappointments may be numerous. Results will be best from eggs three to five days old ; although hens are liable to hatch somewhat stale eggs, incubators do not succeed well with them. The chicks are ready for despatch as soon as perfectly dry and strong on the leg. Any not strong are likely to be crushed by the others, so it is necessary to pack in the order in which they are hatched, as a few hours makes a great difference in the strength and ability to stand and walk. It is quite marvellous how well they travel, and what long journeys they are able to accomplish quite satisfactorily. In sending once to a remote part of Ireland, through delay at some of the junctions, the chicks were three nights and two days in their box, but all arrived safely and did well. This shows that at such an early age warmth is the chief element needed ; the yolk of the egg absorbed by the chick before it leaves the shell providing the nutriment necessary for forty-eight or even more hours.

"The best method of packing is in a box 10 in. long, 7 in. wide, and 5 deep, each to contain twelve chicks ; less are not enough to keep each other warm, in cold weather, and if more are packed together some are likely to suffer. The box is lined with hay and forms a nest similar to that of a wild bird. In order to keep the nest the required shape the corners are stuffed with paper, so that the chicks cannot get into them, and be crushed. A piece of flannel is attached with tacks to the four corners of the upper part of the box, resting on the back of the chicks, keeping them warm and confortable, and in the event of the box being overturned in transit, prevents their coming into contact with the hard lid. The sides of the box should be ½ in. lower than the ends, to provide ventilation. The air then passes under the lid, and over the flannel. Notice should be sent to receivers, so that brooders will be warmed, and chicks not left at stations. Should there be any delay in transit during intensely cold weather, and the chicks arrive seeming somewhat lifeless, they should be immediately placed near the fire and thoroughly warmed, and afterwards will show no illeffects for being delayed on route. If it is intended to rear them with a hen that has been sitting three weeks or thereabouts, one chick should be given her at dusk, and by the morning it will be seen whether she means to take to the brood or not. She usually does, provided she has sat the usual time. When a brood is ordered with a hen the chicks should be packed as described, and the box tied to the inside of a hamper with the hen beside it ; she hears the chicks and

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thus keeps quiet on the journey. Losses very rarely occur, and last year, in sending 1,000 to one man, only eight had to be replaced. Ducklings may be sent in the same way, and travel equally well. Sometimes chicks a week old are asked for, but that is an age not suitable for long journeys, as chicks become hungry and trample each other in search of food. There is little doubt but that in course of time the sale of newly-hatched chicks will quite supersede that of sittings of eggs, which so often prove disappointing both to the vendor and purchaser. One can sometimes send several dozen of eggs across the Channel, and every egg hatches, while others from the same pens, sent a few miles by rail, give the poorest results. The first lot escapes the sudden jar or jolt, which the second lot receives, by which they are rendered useless for incubation. In the case of people who are still under the erroneous impression that chicks hatched artificially are not as strong as those hatched in the natural way, plenty of broody hens should be set as soon as these are obtainable. From February on, the best method of setting these is in weather-proof boxes, properly made for the purpose, and well ventilated, put out on the ground in the open air. After each lot has hatched the range of boxes is moved to a fresh spot, and incubation starts again with another lot of hens. The returns are speedy from the sales of sittings of eggs and newly-hatched chicks, and the more valuable the stock from which they are sold, naturally, the higher the prices."

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Lice on Poultry.

Body lice are to be found upon almost all chickens, as well as on many other kinds of birds. Their presence in small numbers on matured fowls is not a serious matter. When body lice are abundant on sitting hens they go from the hen to the newly-hatched chickens and often cause the death of the chicks. The most successful methods of destroying body lice are three in number. The provision of dust or earth wallows in which the active hens will get rid of lice. These dust baths should be especially provided for yarded chickens and during the winter. Dry earth can be stored for this purpose. Sitting hens should have access to dust baths. The second method by which body lice may be destroyed is the use of insect powder. The pyrethrum powder is considered the best for this purpose, but is exp-nsive and difficult to procure in the pure state. Tobacco dust is also used. Insect powder is applied by holding the hen by the feet and working the dust thoroughly into the feathers, especially the fluff. The use of insect powder should be confined to sitting hens and fancy stock, as the cost and labor of applying them is too great for use upon the common chicken. The third method is suitable for young chickens, and consists of applying some oil and grease on the head and under the wing. Do not grease the chicken all over. With vigorous chickens and correct management the natural dust bath is all that is needed to combat the lice.

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Preparing Birds for Show.

There is a great deal more in this than the average breeder imagines. By this I do not allude to faking. When a bird is being brought on for show, it has little attentions that the whole flock do not get. The food varies, and such things as linseed, well boiled, is added, and little scraps of meat. Every now and then the bird is given a day in a wire pen, and is trained to the stick, and naturally made quiet, so that when on the bench the judge sees him to the best advantage. If the leg is coloured, they are best washed occasionally, and a little vaseline put on, but if white, the washing is enough. The comb and face can be so done, but only use fresh water and not oil after, as this holds the dust. All these, if done quietly, get the bird used to being handled, and then, when required to be dressed for the bench, it submits quietly, and is not disturbed or flurried. The time required for such treatment varies. If a quiet breed and the birds are always kept quiet, a week or fortnight is enough, but sometimes for wild breeds a month is needed, and even then they do not appear at ease in the show pen. My own bantams never get any training, for I can go into any of the pens, pick them up, and they stand quite still on my hand, hence come to the front when penned.—"Reynolds."

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Scratchivity is a virtue to be encouraged in the hen because upon it largely depends layity, and that is what most of us want.

◆

With hisses and groans the audience greeted the principal scene of the new drama. All hope, then, was at an end. "It's hard to tell just what the public wants," murmured the broken-hearted playwright. "It's easy enough to tell in this case," said the manager grimly. "It wants its money back."

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Colour of Chickens When Hatched.

How often one hears a beginner grumbling as to the colour of the chicks when hatched out, when he has purchased an expensive sitting. He has the mistaken notion that the colour of the down will be that of the adult fowl, this being rarely the case.

Without explaining the appearance of all the varieties of chicks when first hatched, certain observations can be made. The down in few cases indicates the real colour of the adult. In white varieties the chicks are usually white or creamy when first hatched. In white Rocks often the chicks appear sooty or a greyish colour. These chicks are nearly always the purest of colour when adults and free from that objectionable creamy or yellow tinge. In buff varieties the chicks are usually the colour of buff, and often have specks of black amongst the buff. In the black varieties the chicks are nearly always white and black in colour, and sometimes the white predominates over the black. The white is often found on the top of head and tips of wings and breast and thighs. These, which are mostly white, are frequently of the most lustrous black, whereas a solid black chick develops into a dull black, with more or less red tinge in the plumage. In black-red Game, partridge Cochins, and brown Leghorns the chicks have a broad maroon stripe down the back and a narrow stripe on each side, with a brownish tinge.

The brown-red Game is similar to the black-red, only more black in it. In barred Rocks and fowls similar in plumage the chicks are black and white or black and a creamy white. Those which are blackest in the down are nearly always pullets, but may grow into very dark cockerels. In light Brahmas and Columbian Wyandottes the chicks are creamy white all over, and in dark Brahmas and silver-pencilled Wyandottes are a bluish-grey hue, with or without stripes. In gold and silver-pencilled Hamburghs the chicks are buff on white ground colour, with black specks on the head and often black stripes down the back.

Nearly all black fowls show white feathers in the wings in the first plumage. No specimen should be discarded on account of these white feathers, as often they are replaced by feathers of right colour. You cannot judge any specimen till it gets its second plumage.

Leg colour is important to notice, for it often changes as the chicks develop. In yellow-legged varieties if the chick has yellow shanks it will probably come too pale in colour when an adult, but if the chick has, say, willow legs, green, or even black, it very often has a beautiful yellow colour when an adult. Reverse is often seen. Willow-legged varieties are often hatched with yellow legs, but these change to willow as the bird develops.

To know the best specimens so young requires long and constant study, and even breeders with lifelong experience have often been mistaken. Never sell off your chickens till they are well into the second plumage.

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For the Month.

— The Treatment and Feeding of Growing Chickens. —

Most of us will soon have done hatching for the present year; some have already finished. The next important point is to keep the chickens growing, and not at a standstill. How many people coddle and take every care of the chicks for the first few weeks while with the hen or in the brooder, but when they are ready to leave the hen or brooder they are often not fed regularly and are fed with a short ration, and coops cleaned out but seldom. Cleanliness in the coops or chicken-houses is of the greatest importance, for chickens will never grow as they ought to if left day and night in a dirty coop or house, as the odour of their droppings which contains poison, lowers the tone of the system and causes weakness, diarrhoea, and often even death. Those who use coops with floors in should see that they are cleaned and scraped out every day, whereas those who use no floors to their coops need only move them daily on to fresh ground. An important factor in the growth of the chicks is in giving them coops or houses which are roomy and which have ample ventilation without draughts. Chickens always thrive better if kept in small lots than in large numbers, as overcrowding is a great mistake. Do not allow your young chickens to roost on round perches, or crooked breastbones will be prevalent, use flat shelves about three inches wide rounded off at the edges.

Another most important item is the food ration. Don't give damaged and cheap foods and grains, such as sweepings, etc., for chicks if fed on damaged food will never thrive. It is a foolish plan to buy these so-called "cheap foods," which are a few shillings cheaper, whether they are for exhibition stock, or utility. Feed on good sound food and fresh; sour food should never be given, as it is entirely devoid of nourishment,, and taxes the strength already gained to rid the system of it, thus compelling the body to draw upon its reserves and take a step backward. If we want the chicks to grow this is poor economy. Give only that quantity which will be

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Barred Plymouth Rocks: Special Exhibition pen. Ckl, 1st and Sp. at Victoria P. & K. C. Show; 1st and Medal Essendon Show, Vic.; 1st and Sp. Adelaide P. & K. Club Show, 1911; Hens and Pullets, all winners, P. & K. C. Show, Adelaide, 1911. A limited number of settings only. £2 2s. per setting.; Good Utility, £1 1s.

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Pekin Ducks: Never beaten in show pen. Four Firsts, 1 Second, 2 Sp at P. & K. Club Show, Adelaide, 1911, out of five entries. Two Firsts, 1 Second and Special at Royal A. & H. Show, Adelaide, Sept 1910, out of three entries. A limited number of Settings at £2 2s. Good Table Birds, specially mated, suitable for Export trade, 5s. per setting. Reduction for quantities.

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devoured both quickly and cleanly. In places where chickens have few chances of picking up any insect life or food, they should be supplied with animal food, such as finely minced meat, which should always be given as a separate feed, for if given with the ordinary feed they will pick out the meat and consequently leave the rest of the food. Green food should be supplied, chopped up finely and fed from a board or suspended from the roof by a piece of string. Grit is also another most essential requisite.

Many chicks are raised on ground which has been gone over for many years by successive generations of chickens, and has for a long time been bereft of grit. In such cases keep sharp grit accessible ; it is just as necessary as fresh drinking water to help them to digest the food they get. Without grit chicks cannot grind up their food ; the grinding of the food is the first step towards the assimilation of it.

Shade is another important point. An orchard or garden which furnishes patches of sunlight and shade, with a free circulation of air, is the best possible place to rear the growing chicks. Where there is no orchard or woody land furnish a substitute in the shape of shelter boards, which provide shade and shelter from sun and rain. Chickens will get out of the scorching sun or a downpour of rain if possible, therefore these shelters are of great value to them. Any old bagging or hessian stretched over light batten frames will do excellently.

As to the mode of feeding young chickens, there are many methods and many ideals, some believing in the old-fashioned way of giving soft food, others who strongly believe in the "dry feeding" system. Much can be said about both these methods. Soft food should be always given in a crumbly state, and never in a sloppy state. An occasional feed of rice, boiled until it swells (not burst) in milk or beef gravy, helps the chickens on wonderfully, while other feeds might consist of dry coarse wheatmeal bread, and barley meal scalded and crumbled, or whole barley boiled in skim milk, pea meal and pollard scalded and crumbled also. Bread in great quantity, has a tendency to produce soft bones. If milk can be obtained cheaply the soft food should be mixed with it in place of water. There is nothing better than new milk warmed given as a drink to the chickens, as it wonderfully effects the growth and is a grand stimulant. Great care should be taken to give the milk perfectly fresh, and not allow it to remain in the drinking vessels too long till it becomes sour.

As to the dry feeding system, this method of feeding young chickens has been in use now for many years with good results. How much of this system is good for the chicks requires judgment. The system of feeding on egg evidently arose from the idea that this was a natural food, but in practice it has been found unnecessary, and tends to produce constipation,* with the result that when the egg is discontinued diarrhoea becomes prevalent. Chickens, being early risers and having good appetites, require their breakfast soon after dawn. Many poultry rearers leave a good feed of grain overnight with the chicks, so that they may get their first daily meal as soon as daylight appears, but this is not altogether a wise plan, as it attracts vermin, which may mean a great loss. The successful chicken rearer is the one who feeds regularly and often, and, above all, is an early riser.

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Protrusion at Vent.

This complaint, known as prolapsus, is generally owing to excessive straining in efforts to expel an egg, more particularly with old and fat hens. The eversion may be only of the cloaca and present a red and inflamed protrusion, in which case wash the affected part with warm water, smear with carbolised vaseline and press the part back gently. Keep the bowels open by a dose of Epsom salts, and give 3 to 5 drops of fluid extract of Ergot. Feed only on light soft food such as boiled rice and lettuce. In severe cases the protrusion trails on the ground. An ingenious form of treatment is recommended, viz., first wash the parts with an infusion of strong warm tea, place back the part, tie the fowl's legs and place in a small but well ventilated hamper, well padded with straw all round, so that the bird cannot shift her position. Leave alone for twelve hours ; then untie legs and give small feed of bread and milk, and replace bird as before. If protrusion again occurs, repeat operation.

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Half-starved hens show a poor idea of economy. Better over-fed than under-fed.

The poultryman who cannot get a reasonable number of eggs every month in the year will find difficulty in making both ends meet.

You can generally learn something from your neighbour in poultry matters, even if it is only how not to do it.

TICK

South Australian poultry owners have found that the very best remedy for the TICK CURSE is

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High class stock and eggs in season satisfaction guaranteed.
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T. B. BROOKS - - Clarendon.

Pigeons and Canaries.

Victorian Notes.

(By "Blue Rock.")

So far the breeding season over here has been most propitious. There has been an absence of late frosts, and the mortality in squabs has been very light. May this continue!

Mr. W. H. Baker, of the Eastern Market, Bourke Street, who is a large supporter of the fancy and supplies many breeders with necessities, tells me that he has this season already sold one hundred dozen C.P.E. Homer rings. This constitutes a record, and goes to indicate that the Pigeon world is booming.

I had the privilege of a peep into the lofts of a well known firm of Magpie breeders lately, and was astounded to find that this loft possesses birds of a calibre far surpassing anything it has put into the pens in the past. In fact the birds were a revelation. On asking the reason why the firm had not exhibited these birds, I was shown that they all had—but I mustn't tell tales. But when the defect is bred out the Magpie will be found to be on a higher plane in Australia, particularly if by importations other breeders are able to beat the exhibitors under discussion.

The friends of Mr. J. J. Young, well known as a pigeon expert in all the States, will regret to learn that he recently met with a serious accident, the van of the train of which he was in charge as guard, bolting and crashing into another train. Mr. Young was unconscious for over a day. Pigeon men generally will wish him an early recovery.

"Blue Rock" is preparing a short paper on "Mendelism," but, owing to stress of work, has not been able to get it into form for this issue.

WANTED TO SELL.

INCUBATORS AND BROODERS, Simplex, awarded first price (silver medal) Adelaide Exhibition, 1910. Agent for Cort's Patent Cooler-safe, a boon in summer. Send for price list.—D. LANYON, Manufacturer, 46 North Terrace, Kent Town. 6-12.

What is a Champion.

Dear Sir.—In your last issue I note reference made to the fact that Mr. E. A. Grosser has lost his Champion Almond. Now I wish to point out that this statement is not quite accurate, in as much as the Champion Almond Cock is owned by myself, and to substantiate this statement would draw your attention to the prize list at the last Canary and Pigeon Show. On referring to same you will find that the special prize for the best Tumbler in the Show (adult or under 12 months) was won by the Almond Cock owned by myself, and Mr. Grosser's bird (since deceased) obtained 2nd to mine; this, I think, clearly proves which bird is entitled to the privilege of being termed Champion, at least as far as this State is concerned. I would further point out that this special prize was awarded for the best Tumbler (adult or under 12 months) and had Mr. Grosser's young bird been superior to my Almond Cock he would have won the special prize as well as the Cup, as there was nothing to prevent a young bird winning these prizes. The judge himself was quite clear on this point and assured me that had the young bird been superior to mine it would have secured both trophies.

In conclusion I would mention that the three best Tumbler judges in South Australia agreed that my Almond was a superior bird to Mr. Grosser's Almond. Further, this bird has since won Gold Medal for best Tumbler in Show at Port Adelaide, although to be fair I must add that Mr. Grosser did not compete at the latter.—Yours, etc.,

C. WILKINSON.

Brown Street, Woodville.

We are obliged to Mr. Wilkinson for his letter. Our understanding of the term champion is that its use implies that the bird or animal to which it is applied, has, at one time or another gained a championship award but not necessarily at the latest or most important show, and assuming of course that Mr. Grosser's bird had gained such an award, our correspondent, "Rambler," was well within the generally accepted meaning of the word in using it as he did. If we are in error in this as applied to pigeons perhaps someone will be good enough to correct us. Again a bird of outstanding merit is often called a champion without reference to any awards whatever. In any case we are glad to put the matter straight with regard to Mr. Wilkinson's bird, which it will, no doubt, be admitted is not only a champion but the Champion Almond Tumbler of the State, though, as far as we are aware, there has, strictly speaking, been no clearly defined competition for any such award.—Ed. G. and F.)

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Long-Faced Tumblers.

Among the numerous varieties of exhibition long-faced Tumblers none are, probably, more difficult to breed than those dependent for standard perfection on limited sprinkling of an opposite color on the ground color generally pervading the body. Parti-color specimens, such as Baldheads and Beards, are not easy to breed to perfection; but the varieties dependent on even mottling or sprinkling of white feathers on a particular part of the body, or dark feathers on a white body, are even more difficult to produce, the more so as the least trimming is regarded as deserving of most severe condemnation. Such tumblers are of two different sorts, namely, rosewings and mottles. They are frequently crossed with each other, and when the markings become too "gay" (that is, "patchy") with over many white feathers on dark ground, or with dark feathers on white ground, it is customary to pair them back to whole-colored varieties. In head formation and body structure and carriage all long-faced Tumblers should approach as nearly as possible to one self-same standard; but probably none have so far fallen short in the matter of length of face (which includes the

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PIGEON SPECIALISTS,
Have bred some sweet 1910 youngsters
in
MAGPIES, JACOBINS, HOMERS, NUNS.
Prices to suit all purses.
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"Chiltern," Sycamore Grove,
BALACLAVA, Victoria.

beak), than is the case with what are called "long-faced mottles and rosewings." Of course, in mottles and rosewings the sprinkling of opposite color on certain defined parts of the body is the primary requirement and must be enforced; but the necessity of aiming also at the acquirement of a standard head piece in all varieties of this breed of pigeons is obvious.

Taking the two so marked varieties in reverse order of merit, namely, first, the rosewing and next the mottle. The standard ground colors are the following—sound lustrous blacks, reds, and yellows, with sprinkling of white feathers—and whites with sprinkling of dark colors.

— The Rosewing. —

The point of singularity which gives to the Rosewing its pretty name is centered at the butt end of the shoulders; here in circular "roselike" outline are distributed about two dozen (more or less), white small butt covering feathers, each white feather being adjoined by about four dark ones, and no two white feathers adjoining each other; the whole space over which this sprinkling of white feathers among dark ones is found should not be larger than a four-shilling piece in circumference; nor should any white feathers appear on the edging of the butts; about the eighth of an inch from the outer edge of the butts should be wholly of the ground color pervading the rest of the body plumage. This circular white spangling collection or distribution of feathers constitutes the "rose" on the wing of the pigeon, which derives therefrom its name "rosewing." The rosewing has an advantage over the mottle in that it is not so prone to display a patch or sprinkling of white feathers on the frontal above the wattle, but if a very fairly well-mottled specimen be met with in competition with a correctly-marked rosewing most judges give the first place to the sound frontal colored mottle over the rosewing, for this reason, that the mottle has two points of distinction in markings to the rosewing's one only.

— The Mottle. —

All the parti-colored and spangled long-face Tumblers have their counterpart among the more high-class short-faced section of Tumblers, and as the short-faced mottled Tumbler is regarded by its votaries as one of the gems of the pigeon loft, so is the standard mottle the chief among long-faced Tumblers, for it is unquestionably the hardest to produce in points of perfection—that is, if honestly exhibited. The points of standard requirements of this pigeon are two, one is the facsimile of the rosewing, i.e., white spangling on the butt ends of the wing shoulders, the other is the "handkerchief." This is composed of a triangular distribution of white feathers on the top of the back; these are centred in the fore part of the scapular feathers, running from the shoulder blade or inner bones of the wings and joining at the centre of the hollow of the back. These white feathers distributed among the scapular plumage are about twenty or thirty in number; each white feather is separated by four or five black ones from the next in order, but as the two rows converge towards the meeting point in the centre of of the back, an inner V-shaped row is formed in like manner. This white printing or bordering is something like the old-fashioned ornamentation at the four corners of a neck or pocket "handkerchief," and from such triangular imprints on these familiar articles the word "handkerchief" has been transferred to the back and scapular "mottling" on the backs of this variety of pigeons, from which it derives its name as the "mottled" Tumbler. Another great fault of the mottle, besides its frequent disfigurement in having a blaze of white feathers over the wattle, is that very frequently the under feathers covering the upper part of the back show a great admixture of white feathers, almost in patches. This is a great drawback to the standard mottle, which should be a whole sound-colored pigeon, with only spanglings of white at the shoulder, butts, and scapular coverings.

From the foregoing description of strict requirements it will be gathered that the mottled long-faced Tumbler is not only a difficult bird to breed, but that it is one to which, when produced to standard requirements, there must be accorded a very high position in pigeon culture. Black mottles were for a long time the only representatives of this variety; however, nowadays equally good reds and yellows are frequently met with, but as yet these are not as sound in under body color as may be desired, and it is to be hoped may yet be produced. Of late attempts have been made with some measure of success to reverse the order of ground color and mottling, and now and again very fair white body colored specimens, rosemarked or mottled, are met with, having black or red spangling on the wings and back, but room yet remains for much improvement in these.—Stockkeeper, England.

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Tonics.

Iron tonic in some form or another is the one most used in the pigeon Fancy, and certainly with beneficial results, yet here again we have a tonic the full benefits of which can only be got by regular use. It is a strange fact that fanciers who may be needing and using these tonics, or even when using any medicines for their ailing favourites, soon get tired of giving them regularly. They would in the place of any remedy which, maybe, needs to be given for two or three weeks, prefer some such method as the old-fashioned blood-drawing, something sure to kill or cure at once, forgetting that even in pigeons, whenever they are ailing, nature must be coaxed, not driven. Nature is a rummy old dame, needing a terrific lot of coaxing at times, but if persevered with (it may be a short time, it may take a long time), you can usually obtain your end.

And that is where the benefit of tonics comes in to coax and assist Nature, and iron is especially able to assist during the moulting season; indeed, in many cases it is used by fanciers all the year round. Given in small doses in the drinking water no doubt it does assist to keep them in a fit condition, but let me at once say that no sort (that is, as far as I am aware) of iron by itself can cure the usual diseases to which our favourites are subject; yet I have known fanciers who, having a bird or two with roup or such-like disease, have simply treated them with a course of iron pills. Now, to my mind, iron, be it in the form of pills or otherwise, is purely a tonic for getting them into condition either for show purposes or when they are recovering from illness. That is above all times the time when iron does good.—"Clayfield," in "Feathered World."

Fanciers will, we know, join us is sympathy with Mr. E. A. Grosser, who has suffered a sad bereavement by the death of his wife, which occurred on October 11th after a long and painful illness extending over a period of nearly three years.

The Value of Green Food for Pigeons.

Any variety of cabbage will be eagerly welcomed by your favourites, and the great advantage of this vegetable is that it can always be readily obtained.

Rape and millet seed sown in shallow boxes covered with inch-mesh netting, through which the green food grows, are excellent foods. These boxes can be kept, if necessary, indoors until it has grown up, then if put into the aviary the birds will eat all above the wire, when the box can be taken away and the greenstuff will grow again.

But the green food par excellence for pigeons is lettuce, and this can be so grown that one has a continual supply all the year.

Any true fancier after once seeing how much his birds appreciate green food will consider nothing he can do too much trouble to obtain a regular supply.

One other little tit-bit which is easily obtained and much appreciated by pigeons, and I have done. I refer to stale breadcrumbs. Most of us get some pieces of bread (which generally are thrown away). Just crumble a handful up and give it to your birds, both the breeding stock and the youngsters.

A fat, lazy pigeon will not look at it, but a bird that is keen and fit will soon make a meal off it, and as an addition to the ordinary diet or as an occasional change it will do them nothing but good.—E.P.

O.K. LOFTS.

This is where the Champions are bred. At 1911 Sydney Royal we won 2 Champions, 6 Firsts, 3 Seconds, 2 Thirds with 11 entries only. At S.A. Pigeon and Canary Show we won the "Blondinette" Cup, the "African Owl" Cup, against 15 others also the "Short-face Tumbler" Cup for best young tumbler, all with home bred birds, also a number of Specials, Firsts, Seconds, and Thirds. To give amateurs a start I have for sale Blondinettes, African Owls, Short-face Tumblers, Nuns, Turbits, etc., from 5/- each. Fifty to clear before breeding season. Apply at once to—

E. A. GROSSER,

Hamilton, S.A.

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Nesting Pigeons.

Every pigeon loft should be fitted with an ample number of nesting places, at least one box, which should be large enough to hold two nest pans, being allowed for each pair of birds, and where the pigeons are permitted to mate and pair up amongst themselves it is as well to provide a few extra or spare boxes so that all the birds can to some extent choose the situation of their nest and have no need to interfere with one that is occupied.

Make each nesting place 2ft. long, 14in. wide, and 15in. high inside, this size being sufficiently large for Homers, Turbits, Owls, Magpies, Jacobins, and others of similar build, whilst Pouters, Runts, Carriers, and Dragoons require nests about 2ft. 6in. long, 16in. wide, and 18in. high.

The reason for providing two nests for each pair of birds is that the hen usually lays again before the young ones already hatched are out of the nest, and unless there is a vacant nest handy, she will either abstain from laying, or try to turn another hen out of a nest.

Nest boxes should be well limewashed and dusted with a little yellow powder of pyrethrum flowers or other insect powder, and the bottom covered with clean sawdust. Nest pans should always be provided, as they greatly assist towards keeping the boxes clean and free from insects. Nest pans can be obtained in various sizes and of various materials, glazed stoneware pans being excellent, as they are sanitary, and being a little wider at the base than across the top, cannot be easily overturned by the birds, whilst with the inside being ribbed or corrugated and the rim round the top turned over inwards, the nest cannot move or slip.

Nest pans for Tumblers, Turbits, Owls, and similar sized birds, should be at least 7in. in diameter, for Homers, Antwerps, Jacobins, Magpies, and Fantails 8in. or 9in. in diameter, for Carriers and Dragoons 10in., and for Runts and Pouters 11in. in diameter.

A little clean sawdust should be placed in each nest pan, and some clean, well-rubbed straw cut into 3in. lengths scattered about the loft where the birds can easily reach it, and as soon as a nest is made it should be dusted with a little insect powder.

As a rule, pigeons lay two eggs, and as soon as the first is laid, it is a good plan to remove it and substitute a dummy egg until the second makes its appearance, so that the two eggs will both hatch at the same time. The period of incubation is about seventeen days, both the cock and hen in turn sitting upon the eggs, whilst both also assist in rearing and tending the young ones after they are hatched. As soon as the squabs are able to feed themselves they may be separated from their parents, and should be placed in a loft away from the breeding pairs. —"Feathered World."

CAPTAIN H. E. U. BURKE, OF THE 3rd KING'S AFRICAN RIFLES, AND ASSISTANT MASTER OF SYDNEY GRAMMAR SCHOOL.

Writes of the Use of This Medicine in British East Africa, Where Fever is a Deadly Scourge.

The following letter from this much-travelled military man will be read with interest by those seeking health after severe attacks of wasting weakness or fever :—

250 Ocean St., Paddington,
January 17, 1911

CLEMENTS TONIC LTD.

I have derived great benefit from your tonic in Africa, brought to my notice by an Australian in Uganda.

I contracted malarial fever during the Boer War, and when on active service in Uganda. I was taken to Nairobi, the seat of government in B. S. Africa, in a state of collapse. The greatest care had to be taken during my convalescence.

It was at this period that Clements Tonic was given to me. It acted at once on the appetite, giving a desire for food, and a gradual restoration to health resulted.

I was so impressed with the medicine I recommended it to my brother officers, but, unfortunately, it was not to be procured.

I have cause to be very grateful to this most excellent medicine, and I consider I am doing a duty in testifying to its worth.

(Signed) CAPT. H. E. U. BURKE.

Don't be ill any longer, if you are ill, but send for this medicine. It will make your life worth living, give you health and strength. It is a wonderful nerve and blood remedy. All chemists and stores sell it. Send for it.

Home Notes.

In the Kitchen.

— Remember —

That when a baking dish gets burnt in using, it should not be scraped; simply put a little water and ashes in it and the burnt surface will come off easily without njuring the dish.

That a steady heat for baking annot be expected from a stove hat is imperfectly cleaned and hat is choked with clinkers. Too often the cook blames the stove or imperfect work, when the fault ies in her own neglect to put it n baking or cooking order.

That all green vegetables should be kept in a cool, dark place, but ot in great quantities. Roots of ll kinds should be kept in dark, ry places, because light, warmth, nd moisture produce either germination or decay.

That egg stains may be removed from spoons, caused by sing them with soft-boiled eggs, y taking a little common salt between the thumb and finger and briskly rubbing the stain, which will soon disappear.

That kitchen paints will soon cquire a shabby and dull look rom the frequent cleaning that is ecessary in this room. The use of soap only increases the difficulty, especially if the paints are varnished. The best plan is to boil one pound of bran in a gallon of water for an hour, then wash the paint with bran water, and it will not only be kept clean, but bright and glossy.

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Burns.

When a child receives a burn on any part of its body, a free application of soft soap almost instantly removes the fire, and soothes the pain. This is a very useful hint to know, as almost every housewife keeps a supply of the soap in the house, and no time is lost in applying the remedy. If the injury is severe, a little linseed oil may be used as soon as the pain subsides, and then flour should be dusted over, but the soft soap will, in slight cases, do all that is necessary.

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Rust-Proofing.

If new tin be rubbed over with fresh lard, and thoroughly heated in the oven before it is used, it will not rust afterwards. For stained tinware borax produces the best results. If a teapot or coffee pot is discoloured on the inside, boil it in a strong solution of borax for a short time, and all its brightness will return.

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To Wash Cotton Dresses.

For light colours, four quarts of flour starch are made and strained. Half of this is put into two pails of soft water, in which the garment is washed until clean. Water is then added to the remaining half of the starch, and in this the dresses are rinsed. They are dried and ironed on the wrong side.

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Skim-Milk in Bread-Making.

It is a common practice in many households to use more or less milk for mixing bread dough, since it is believed that the quality of the bread is thereby improved. Frequently skim milk is used instead of whole milk. Doubtless comparatively few persons realize that skim milk has a fairly high food value and that its use makes bread more nutritious, in addition to improving its quality. It must be remembered that when the cream is removed the milk is deprived of only one of its constituents, namely, fat. It still contains practically all the highly nutritious casin and other nitrogenous materials, as well as the milk sugar and ash originally present. Taken by itself it is "rather thin," and one has to drink a large quantity to get the needed nourishment. Further, it is so readily assimilated that it does not long satisfy the sense of hunger. But when taken with bread or used in cooking it is a valuable food material. A pound of lean beef contains about 0.18 pounds of protein, whose principal function is the formation of tissue, especially muscle. Two and one-half quarts or five pounds of skim milk will furnish the same amount of protein as a pound of rump steak. Two quarts of skim milk has a greater nutritive value than a quart of oysters.

Skim milk materially increases the yield of bread and consequently the profits in bread making. Two hundred and eighty pounds of flour will take up 175 pounds of water in mixing the dough and yield 94 four-pound loaves, there being a loss of 71 pounds of water during baking. The same quantity of flour would take up 210 pounds of skim milk and yield 110 four-pound loaves, the shrinkage during baking being about 56lbs.

Loose Wall-Paper.

When paper cannot be retained on a wall by reason of dampness, make a coating of the following ingredients :—¼lb. shellac, and one quart of naphtha. Brush the wall thoroughly with the mixture, and allow it to dry perfectly, and you will find this process will render the wall impervious to moisture and the paper in no danger of being loosened.

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Scorched Linen.

If linen has been scorched it can be restored in this way :—Extract the juice from three or four onions and mix it into about an ounce of soap, four ounces of Fullers' earth and a pint of vinegar. Boil all these for a few minutes, and when nearly cold spread it (or some of it) over the scorched linen and allow it to dry in the air ; afterwards wash it with warm water.

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To Preserve Meat During Hot Weather.

Wrap the meat which is to be preserved in a thin linen cloth dipped in a mixture of equal quantities of sterilised (i.e., previously boiled) water and acetic acid, or, if preferred, use pure vinegar. Another method is to suspend the meat by a hook, placed over a plate sprinkled with a few drops of creosote, and to cover both with a muslin cover. The smell of the creosote does not affect the flavour of the meat, and it effectually keeps away flies from the larder.

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To Preserve Parsley.

Choose fine fresh sprigs, wash them and boil them for two minutes in water containing a teaspoonful of salt to each pint. Drain the sprigs on a sieve, and set them in a cool oven or over the rack of a stove that they may dry quickly. When quite dry, store the parsley in a tin box or in a pickle jar with a patent lid, and when required for use soak the sprigs for a few minutes in warm water.

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Raisins will stone more easily if slightly warmed, and candied peel should always be placed in the oven before cutting up.

Tried Recipes.

— A Good Jelly. —

A good strengthening jelly can be made as follows :—Into three pints of water put an ounce each of rice, sago, pearl barley, and hartshorn shavings. Let them all simmer slowly until the liquor is reduced to one-third of its original quantity. Strain it through fine muslin, and when it is cold it will be a firm jelly. A spoonful of this may be stirred into soup, broth, milk, etc., or be dissolved in wine.

— To Boil Rice for Curry. —

Allow one tablespoonful for each person ; wash it in two or three waters and throw it into a stewpan of fast boiling water which has been slightly salted. Keep the lid off the stewpan and boil the rice fast for a quarter of an hour. Drain the rice through a colander and return it to the stewpan. Set it covered by the fire for another five minutes and shake it occasionally to separate the grains, but avoid stirring it with a fork.

— Baked Prunes. —

Put ¾ of a pound of prunes, stewed and stoned, and the kernels blanched in pie dish. Rub quarter pound butter into one breakfast cupful flour, and add half teaspoonful baking powder. Beat up an egg, add two tablespoonfuls of soft sugar and a teacupful of milk, and stir into flour, mixing well. Pour over prunes, and bake for half an hour, till firm and nicely browned.

— Lemon Preserve. —

One pound of sugar, 4ozs. of butter, 6 eggs, leaving out the whites of two, the juice and grated rind of three lemons. Put into a saucepan, and stir over a slow fire until it is as thick as honey.

—English Plum Pudding (plain.)—

One pound of flour, 1 pound of raisins, 1 pound of currants, one pound of suet chopped very fine, 1 pound of sugar, 1 teaspoonful of baking powder, 1-2 pound of candied lemon peel, chopped fine, 1 nutmeg (grated) ; and a little cinnamon. Sift the flour, baking powder and sugar separately, then together. Now add the other ingredients and when all is well mixed moisten with sufficient cold water or milk to make a stiff batter. Turn into a strong cloth that has been well greased and floured, tie securely and plunge into a pot of boiling water. A plate should be placed in the bottom of the pot so as to keep the pudding from sticking. As the water boils away add more and keep the pudding cooking for at least five or six hours the first day, then when it is to be used a couple of hours boiling will be found sufficient to heat it up.

— Oranges in Syrup for Dessert. —

Score the oranges all over in imitation of basket work, or any other design, then simmer the oranges in water till nearly done through. They must be thrown into cold water to soak for 24 hours, changing the water two or three times, after which they must drain on a sieve for several hours, and then be put in an earthern pan. Take the liquor the oranges were boiled in, and to every pint add ½lb. of sugar. Boil this for an hour or two, and pour over the oranges. Let it stand for one day, then pour the syrup back into the saucepan, and again boil for an hour or two, skimming it carefully. Then pour over the oranges, repeat this three times, and lastly put the whole into jars and tie down.

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Irate Father (who has been trying to satisfy John's curiosity on every known subject under the sun) : Now, Johnnie, if you ask me another question, I'll whip you on the spot. Johnnie, whose undying curiosity overcomes even the dread of punishment) : What spot, papa ?

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Editorial Notices.

TO ADVERTISERS.—Alteration of ad ertisements should be in our hands not ater than the 15th of the month.

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AGENTS.—Messrs. ATKINSON & CO. nd MESSRS. GORDON & GOTCH, Ltd.

The Editor will be pleased to receive rrespondence and answer questions. hese replies will, for the most part, be nt by mail, unless received just prior o date of publication.

PUBLISHING DATE.—On the 25th of ach month preceding title date.

DISCONTINUANCES.—Responsible subcribers will continue to receive this urnal until we are notified by letter to iscontinue, when all arrears must be aid.

Garden Reminders.

Shade seed beds.

Put out summer seedlings.

Liquid manure lawns.

Push on Cannas.

Roses can be budded.

Stake Carnations.

Layer spring flowerers.

Plant out any from pots.

Get in later dahlias.

Cut back early planted ones.

Sow annuals for late flowering.

Cut back zonale pelargoniums.

Also verbenas, water and mulch.

Cut back perpetual carnations nd force growth.

All flowering plants are imroved by liquid manuring.

Always give a "soft" drink of ure water before the stronger onic.

Cut back chrysanthemums for edding work.

Make early sowings of Pansies nd Stocks.

Pot up rooted cuttings of chryanthemums.

Save seed of choice spring flowring annuals.

Lift and store spring flowering bulbs.

Any evergreen shrubs or climbers may be put out from pots.

Keep surface soil loose by frequent hoeing.

Plant Bougainvilleas in sunny positions.

Make early sowings Cineraria and Cyclamen.

Caterpillars will want attention, either finger and thumb or Arseniate of Lead.

Stake flowering carnations to get the best of the bloom.

Put out a pot or two of Petunia seedlings. It is one of the very best hot weather plants.

It is not too late to sow Mina lobata but better get a plant or two of this grand autumn flowering climber.

Try a packet or two of Ornamental Gourds. They give a pleasing variety to the garden.

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In the Garden.

Gardeners usually anticipate hot and dry weather in December, this year they appear to be likely to get it. Still work must go on.

Cannas like the hot weather so make preparations for an extra good show of bloom by giving plenty of water and surrounding the plants with a good mulch. Seed can be sown now. Soak before sowing.

Chrysanthemums are another thirsty subject. Cut these back where they are wanted for decorative work and don't forget that mulching will save the water bill.

Pot up rooted cuttings as they are ready and move on those already potted to larger sizes as required. Put in some more if required.

As zonale pelargoniums get past their best cut back for early autumn flowering. A dozen or two of the best named sorts from the nurseryman put out now will do well and prove a good investment. Cuttings will root well in a shaded frame.

The tree flowering verbenas are a great stand by in the garden. A bed of them cut back now and well mulched will be a sheet of bloom by the end of next month. Peg down new growths as they develop, this will add much to the beauty of the bed. This is another line in which some new varieities will add a lot of interest and beauty to the garden at the cost of very few shillings.

Don't forget that this is the time for dahlias. Some of the strong growing early sorts will be all the better for being cut right down. If you have not grown dahlias get a few named sorts from the nursery and include some giant singles, peony-flowered and pompones in your order.

Delphiniums are coming along finely, tie up to light neatly placed stakes, cutting out the flower spikes as they pass their best will mean a much longer run of bloom. Get a pot or two of good seedlings. They can be put out quite safely now if shaded. Single pot small seedlings for a time if you want to make quite sure of success.

Hydrangeas are not the easiest things to grow. Give water regularly and a little liquid manure once a week.

Watch the roses for suckers trace them down to the joint and twist them off. Cutting off at ground level only makes them worse.

A plant or two of cobea scandens is well worth getting for quickly covering a trellis.

There is a lot of difference in the flowering habit of a mixed lot of gladiolus. Mark the best in any batch and keep for separate planting.

Where ground has been mulched always water at the root. A whole lot of water sprinkled on a mulched bed never gets to the roots at all.

Make another sowing of zinnia seed. Early sown seedlings are apt to run into and also out of flower very quickly. Zinnias are one of the hardiest and most drought resisting of garden flowers. They do not ask for much in the way of manure and will bloom well on less water than most.

Pentstemons are one of the most satisfactory of perennials. Cuttings of side growths will root readily in any sandy soil under a bell glass or cold frame. Always choose the brightest and cleanest flowered plants for taking cuttings from.

Get in early sowings of stock during the month. One gets some excellent flowers from a packet of mixed seed. Sow thinly in boxes of light soil, scatter a little old sifted manure over the surface, keep lightly shaded. See that the seed box is kept just damp but avoid anything like sodden material. Two or three colours, say, tall crimson for centre, with medium pink edging and an outer ring of dwarf whites would be very effective.

Fuschias are not the hardiest of plants for the open air hot country garden but that is no reason why even in such places they should not be much more freely used than they are. For half shaded positions which do not get the afternoon sun and which are protected from hot winds there are few more satisfactory plants for lasting work. They dislike a heavy soil and require plenty of water. There are any number of varieties to choose from. Madam Jules Chretien, Rose of Castille, Phenomenal, Lord Byron, Glory, Molesworth, General Roberts, Earl of Beaconsfield, Swanley, and Avalanche, would be half a sovereign's worth of very lasting pleasure. They are easily propagated by cuttings of the growing points rooted in any sandy soil.

Always transplant seedlings just before rather than just after rain. It makes a lot of difference. After setting give each a separate drink. Watering with a hose is deceptive. Many people think they have finished watering a bed before they have really begun. Before going on to the next just make sure that the plants have really had a drink and not merely a sip and a promise. One good soaking will use no more water than a dozen sprinklings and do twenty times the good. Afterwards just chip up the surface and you will be surprised to find how the ground will hold the moisture.

Black birds seem to be quite unnecessarily numerous and cute this year. One likes to hear their morning and evening hymn of course, but last month they went through some melons which were just showing above ground in the seed pots, not only so, but they quickly connected the seedling with something underneath and as soon as they had finished them started gouging out the seed. This month they have tackled some amaranthus though the boxes have wire netting covers and they are already casting gluttonous eyes at the peaches. It looks as if we are going to be very tired of blackbirds before long.

Just lately it occured to us that a fine mist spray running pretty continuously on hot days would be more appreciated by our ferns than just an ordinary syringing. To unscrew the nozzle from the spray pump and substitute it for the rose on a hose on a nearby tap did not take long, nor did it take long to discover that it was a good idea. It is also excellent for watering fine seeds. It may not be worth getting a nozzle and a hose, but if one happens to have both there is no just cause or impediment why they should not be joined together. Any ordinary pressure will give a splendid spray for either of these purposes.

Except on deep retentive soils this has certainly been a poor rose year, though it promised well at the beginning of the season. Many gardeners who are usually able to cut great quantities of first class flowers have this year been hard put to it to find enough to fill a decent sized bowl. Where a big display in autumn is wanted the plants should be kept with only sufficient water to keep them from suffering, but the averag gardener will prefer to keep them going by hard cutting, libera manuring and copious watering and take the luck as it comes. In the ordinary garden the latter is no doubt the best or often the only method for the rose plants are so mixed up with other things which must have generous treatment. Where, however, the roses are grown by themselves the former has much to commend it, for it is certainly impossible to get the best of roses throughout the summer and autumn, too, and even if one overcomes the difficulty of the long dry days and hot nights, a scorching day or two may play havoc with a show of summer roses which lack the substance and staying power of the early spring and autumn flowers. This, of course, applies more particularly to the northern suburbs and any dry limestone country. In the hills the December and January rose is as fresh and fragrant as its October sister bloom.

Liquid Manure.

Comparatively few amateur gardeners avail themselves of the help which liquid manure can give them whilst some no doubt overdo it. There can be no hard and fast rule as to quantities, but when we remember that the farmer grows his wheat on a manuring basis of about one quarter of an ounce of super to the square yard applied once and that in general manuring super usually figures at two or three to one as compared with potash and nitrogen, it is evident that to handle sulphate of potash, nitrate of soda, etc., by the bucketful or even handful is not only unnecessary but liable to be harmful. It is true that the deep cultivation which garden soil receives or ought to receive and its continuous cropping make a much more liberal manuring necessary, but still there are limits. A few figures will perhaps lead to a truer sense of proportion. Thus, one square yard—a convenient measurement for the garden—is the 4,840th part of an acre, so that, say, 4 cwt., a fairly heavy dressing, is equivalent to 3lb. per square rod or 2ozs. per square yard. Now 2ozs. does not make much of a showing on a yard of ground so the beginner doubles or trebles the quantity. If he is using super he does no harm, if he does not repeat the dose often, but if the chemical happens to be

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nitrate of soda may do. Another point to keep in mind, is that each of the three important classes of artificial manures, have, broadly speaking, different effects, and also that they act differently. The gardener is always safe in using super on bed, border, shrubbery, or lawn. It will have less visible and immediate effect than, say, nitrate of soda, but it will be doing good steady work. Primarily the function of phosphate is to hasten maturity and prolong it. Try giving a bed of half grown annuals super at the rate of half an ounce a week for each square yard of space. It can be used dry or in solution. As, however, it is apt to disfigure foliage, the safest way of giving it is to water the bed thoroughly, then take as many half ounces as there are yards, dissolve it in sufficient water and apply it evenly over the whole bed. Where new beds are being made up dig in and thoroughly mix with the bulk of the soil from one to three ounces per yard. Potash manures are not regarded as being of great importance in the flower garden but half the quantity of sulphate of potash added to the super, will add nothing to the work, the merest trifle to the expense, and quite possibly very considerably to the result. Nitrogen is an important factor in plant growth. Wherever green abundant luxuriant foliage is required as in a lawn, sulphate of ammonia or nitrate of soda will do what is wanted. The most neglected part of many gardens is the lawn for there seems to be an idea that grass will go on for ever, but food is just as necessary for the grass plant as for any other. Try the following prescription after each cutting, say once a fortnight. Give the lawn a good soaking, then dissolve sulphate of ammonia —nitrate of soda is even quicker in its effects—at the rate of half an ounce to the gallon of water and use it at the rate of one gallon to each square yard. Do not use either in a dry state, the sulphate especially being very caustic. In addition use double the quantity of super in the same way once a month. Nitrate of soda at half the above strength will often prove a grand pick-me-up for plants which hang fire after they are put out. Finally—a little and often is a good motto to paste on the liquid manure can.

◆

"Go it, Billy? Yer ain't arf licked yet!" cried an enthusiastic spectator of a street fight. "Well you come and 'ave the other 'arf?" said Billy. "I ain't greedy!"

Seed Sowing.

Seed sowing, that is of the finer sorts, is not perhaps as simple as it looks, this is especially so in hot weather, outdoor work. As everything depends on successful germination, it is certainly worth while taking all reasonable care. Each fertile seed is really a living thing though one is apt to think that life begins when growth starts. There are three things a seed requires—heat, moisture, and air. We need not worry about the first just at present. The other two are equally important. Naturally seeds want only a little moisture but they want that little very much. More seeds probably are killed by kindness in the shape of watering than is generally supposed. There is a right and wrong way of supplying moisture. The wrong way is to give it with a coarse rosed can. The best possible condition for seed germination is that which does away with the necessity of adding water to the soil till the plantlets appear. Seeds breathe, therefore they want air. They inhale oxygen and exhale carbonic acid gas. The problem for the grower is, how best to provide for these needs. A few kerosene boxes laid sideways up on a bench or rough table raised a couple of feet above the ground—an old galvanized iron case on gas pipe legs does excellently — under any light shade, which can be either brush, calico, or lattice, or even a tree if the foliage is not too dense, make as handy a seed raising plant as we know of. The shade, by the way, should be three or four feet above the seed boxes. The seedlings when they come are out of the way of some at least of their enemies and attending to them is simplified. Having got the boxes in place the next thing is to fill them. Just here it is as well to remember that the seed starts out with a store of nourishment and that the amount drawn from the soil used will be very small indeed so the quality of the soil need not be considered beyond remembering that the poorer it is, in reason, the better, but its texture is of very considerably importance, for on this depends the amount of future watering. Clay is the one thing to avoid in making up a open porous soil. Sand, very old manure which has lost all life, leaf mould and some old rotten turf are the best of ingredients. Aim to get a mixture which will be firm and compact but neither hard nor stoggy. First put a layer of charcoal, crocks or coal ashes two or three inches thick in the box then a good layer of dry leaves. Next fill the boxes to within two inches of the top with the prepared soil which should be fairly fine but not dust fine. Pack level and press this lot in so that it will not sink and add another inch of the same soil which has been put through a fine sieve, if it has been baked so much the better, smooth this and water till the soil will hold no more. Leave it for an hour or two. Sift another thin layer of soil evenly over the box then sow the seed thinly and as evenly as you can. Sift a very thin covering of soil and press the surface gently with a piece of board. Now scatter a layer of old cow manure rubbed fine, less than a quarter of an inch thick to act as a mulch and cover the box with a piece of glass which has been smoked. Calico stretched on a lath frame will do as substitute. Most seed will be showing before there will be any need for watering, but if this become necessary and it is done with a reasonably fine rose the mulch will prevent any washing or hardening of the surface which is fatal to very fine seed. This is more trouble than filling a box with ordinary soil and a rough and ready method generally, but if it is worth buying good seed or any seed at all it is surely worth while giving it the best possible chance, and this way will raise ninety per cent. of seed which is raisable. Raise the cover each day and keep it raised when the seedlings show.

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"Doctor," said a patient, "what shall I take to remove the redness of my nose?" "Take nothing, particularly between meals!" the doctor answered.

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Art in the Garden

From "American Horticultural."

From the earliest time of which we have any record the more civilized of mankind has been wont to plant a garden near his dwelling place, and some of the earliest books were on the subject of gardening; but at no period has the love of gardening—in its widest sense—been more general than at the present time which is doubtless evolved from the hereditary inclination for this pursuit in which men and women have indulged throughout all time; and there is probably no more fascinating recreation than the developing of ideals in gardening effects, a pleasurable occupation which can be followed by both rich and poor.

The art of gardening has probably never been at a higher standard of excellence than at the present day, but this is, however, more the case in connection with the growing of individual plants to perfection together with the propagation and growing of plants in general: in these matters the average professional gardener needs little or no instruction. But the word "Art" in the title of this paper is used in a totally different sense.

— A Cause of Failure. —

Many of the most successful raisers of plants, who take numerous prizes at fairs, are often wanting in artistic taste, and are apparently unable to lay out and plant a garden in an artistic manner. The many failures which one sees are, in most cases, evidently caused by the fact that the individual responsible did not understand how to apply artistic principles to the designing of the garden rather than to any want of skill in carrying out the details. It is in this connection that we use the term "art," and there is no reason why our gardens should not be examples of the truest and highest art.

Landscape architecture (we use the term in preference to landscape gardening because gardening is more the cultivation of and caring for plants) is unquestionably a fine art, for art is the creation of organized beauty, whether upon canvas, marble or the surface of the earth.

As various degrees of talent exist among artists in oils, water-colors and stone, the same variation in skill is to be found in landscape artists. To excel in either of these branches of art a born and trained artist is required, and although the possession of genius like that of Raphael or Turner is more a question of endowment than training, at the same time a genius requires to study first principles, and every one studying along those lines is capable more or less of increasing his knowledge of and skill in the art he follows.

— Fidelity to Nature is True Art. —

The dominant object of ornamental gardening should be to beautify home surroundings, and this can only be accomplished by composing into a pleasing picture, lawns, trees, shrubs and other accessories of a garden. But to have anything beautiful and artistic it must be true. The ancient Greeks knew this, hence their success in giving form to beautiful things. A garden should be the home of the highest form of art because it is the home of natural and living, not artificial and dead, things. True art is always marked by fidelity to nature, and it is the want of naturalness which often causes our gardens to be inartistic.

In this connection we do not overlook the fact that in a few positions what is known as the "architectural" is more appropriate than the "natural" style, but such positions are very rare, and exist only in sufficient numbers to prove the natural to be the more perfect.

— Faulty Education. —

In these days schools of art are to be found in almost every city, but it is to be feared that these do not always foster true artistic feeling, as they give so little encouragement to the observation of nature. No doubt those schools are productive of good in certain directions as they assist in producing persons capable of designing useful decorative work and the adapting of geometrical forms to various articles of use and ornament. But skill and cleverness in this work may exist without any true artistic feeling; in fact the latter is usually discouraged by the system pursued at these institutions.

Whatever opinion one may have of the methods of decorating the interiors of our homes, there can be nothing but condemnation when this decorative process of geometrical patterns is brought into the garden, thereby causing the foregrounds of beautiful scenery to be daubed with flower beds formed like a piece of linoleum.

Beauty is not attained by simply filling a garden with beautiful flowers. The total effect of a garden so filled is often marred by the separate effect of its contents. One may have an artistic garden, or a botanical garden —a museum of plants, or a garden like a figured carpet, but not all at the same time.

— Formality Destructive of Real Beauty. —

The merely decorative ideas of gardeners have often marred our gardens by means of what are known as "carpet-bedding," "mosaic culture," and the "bedding-out" system; in these the natural beauties of plants are lowered to the level of mere color designs, without any reference to the habits and characters of the plants themselves, clipping being generally resorted to for the purpose of keeping the patterns geometrical. No one who is a lover of flowers and who is capable of seeing beauty in nature, would allow his garden to be desecrated by this tracery work.

William Morris in his "Hopes and Fears for Art" wrote thus in connection with this subject: "Another thing also much too commonly seen is an aberration of the human mind, which otherwise I should have been ashamed to warn you of. It is technically called "carpet-bedding." Need I explain it further? I had rather not, for when I think of it, even when alone, I blush with shame at the thought." This kind of decoration seems to have been introduced and kept up as a manifestation of a gorgeous and highly elaborate style of gardening—a style which suggests the thought of enormous cost and enormous labor.

— The Charm of Simplicity. —

If an artist wants a subject for a painting he never goes to a garden of this kind. No true artist would prostitute his brush by portraying these "aberrations of human intellect." If he wishes for a beautiful picture he goes along rural byways and there finds many examples of the beautifying effect of flowers being allowed to grow as nature designed they should, and in these cases sees artistic expression based upon the best foundation, viz., simplicity. It was the charm of simplicity which made many of the old-fashioned gardens so restful alike to the eye and brain. In this I do not include the old topiary work—another aberration of the human mind, copied from the Italians and introduced when people were limited to only a few species of shrubs—which is nothing but a brutal murdering of the beautiful forms of trees, more barbering in fact.

In striving to surround a country home with beautiful effects we must keep simplicity and naturalness, as opposed to formalness, continually in our mind's eye. If one sees a garden remarkable for its precision, the strictly geometrical sequence of its flower beds, trees closely clipped for the purpose of "harmonizing with the house," and a general air of stiffness pervading the entire surroundings, it may be passed at once with contempt as it has no artistic value.

— There is No Absolute Rule. —

Many gardens of this description are designed in a building architect's office and are supposed to "fit the house." In all probability the same plan has been used for many other gardens, and it is a fact that they are often drawn without the designer ever seeing the spot beforehand, or having anything before him except the plan of the house. It is a great mistake to suppose there is such a thing as strict rule in landscaping which is capable of being applied to all sorts of situations. Every home and its surroundings invites its own plan, which when executed should give the property added charms of originality, variety, and character. Conventionalism is entirely out of place in a garden, and it is quite impossible to make a design which will fit every situation.

Artistic landscape architecture will never become capable of being governed by stereotyped rules and regulations, except that what Ruskin wrote may be safely laid down as an axiom, "Nothing is great as a work of art for the production of which either rules or models can be given." The more the laying out of gardens is guided by rules, or fashion, the less it becomes an art and the more a manufacture.

— The Bane of Monotony. —

Apart from artistic considerations pure and simple, there is also the monotony which is to be found in many gardens which is so painful, and which does away with the possibility of finding any restful, refreshing feeling in them. It must never be forgotten that change and variety are as much a necessity in gardens to satisfy the aesthetic perceptions, to raise pleasurable emotions in the heart and mind, as in books, a gallery of paintings or sculpture. We can no more expect to derive pleasure from a monotonous garden when the bedding is principally on one pattern, than we should from a universe in which clouds, hills, and trees were all of one shape and size. There is nothing satisfying nor lasting about artificiality.

The botanical system of Linnaeus, for instance, a splendid contribution to human knowledge which did more in its day to enlarge the view of the vegetable kingdom than anything before it, was a purely artificial system. But all artificial systems must sooner or later pass away. None knew better than the great Swedish botanist himself that his system, being artificial, was but provisional. Nature must be read in her own light, and as the botanical field became more cultivated the system of Jussieu and De Candolle slowly emerged, unfolding itself as naturally as the petals of one of its own flowers, and, forcing itself upon men's intelligence as the very voice of nature, supplanted the Linnaean system forever.

— Pernicious Fashion. —

Not only is the lack of variety between different parts of a garden bad in itself, but with stereotyped bedding and geometrical borders all gardens become more or less alike; especially when a certain style is, for the time being, fashionable. In these cases there is not only a depressing monotony in our own garden, but when we visit others we find much the same thing; whereas when true artistic feeling is brought to bear, each garden has a character of its own and every garden its own special features. The landscape architect must make his design thoroughly to fit the situation, and, regardless of fleeting fashion, should use the same pure taste in arranging the living elements of the picture he wishes to produce as an artist does in creating with his brush and colours.

The banefulness of fashion is in nothing more apparent than in the matter of terraces. Allowing architects of houses to interfere with the laying out of gardens is very often the cause of too much terrace, and the ordinary landscape gardener, following mere custom, will even make a terrace on level ground and induce the owner to spend large sums on excavating and walls which have no other effect than to absolutely spoil the place. There are of course situations in which terraces are more or less admissible, as where the ground slopes rapidly from the house and in positions where a level piece of lawn cannot be obtained without, but many country seats have had what might have been fine lawns spoilt by terraces.

— Avoid Terraces. —

The idea of a terrace was first brought from Italy. At one time an Italian garden was considered the proper thing, but the results of introducing a style—which owing to local circumstances is quite correct in the place where it originated — into a totally different environment, has been in most cases only productive of hideousness. Terraces are necessary on the hillsides in Italy, and were first formed in a rough way by the peasants, otherwise the ground could not have been put to any use, as it is the only means whereby the soil can be kept on the steep slopes. Also on these Italian terraces the beautiful olive is planted which has a double use; it gives a natural and therefore artistic effect, and is at the same time a source of profit to the planter.

Even in those situations where terraces may be considered indispensable, the walls can only be looked upon as necessary evils. Much might be done, although rarely attempted, to soften the bad effect of walls in an ornamental garden by covering them with life in the shape of creepers and other plants.

— Planting for Winter Effect. —

In designing a garden the winter half of the year is too often forgotten or ignored, due, perhaps, to the fact that there are many even among lovers of the country who fail to appreciate the charms that may be found in the garden in the depth of winter, and who therefore cannot realize the possibilities in this direction. In this connection we see another point against the inartistic bedding system, for the beds in winter are nothing but mounds of brown earth and the reverse of pleasing even to the inartistic eye. It is a great mistake to suppose there is only bleakness and desolation in the winter. The many evergreens of all shades and shapes capable of enduring winters with a temperature below zero, and the still larger number for the more temperate climates, must, to everyone with any knowledge of plants, forbid such a supposition. Then there are amongst the deciduous species many having their bark of bright pleasing hues, harmonizing well with the dark evergreens and thereby adding additional charm to the winter picture.

— A Knowledge of Plants Essential. —

Bearing this brief outline of the general principles of our subject in mind, it must be apparent that to be successful a landscape artist must not only be capable of designing the framework, as it were, of a garden, but he must have a thorough knowledge of plants. Without the latter it is impossible for anyone to achieve a result which will be truly a work of art.

Every plant has its own peculiar character. Shape, color of leaves and bark at the different seasons, height and habit of growth, evergreen or deciduous; these and other traits all go to make up character. The characters of plants must be known and studied before any one can compose them into a harmonious whole. To expect success without this knowledge is like expecting a person witnout any knowledge of the tones of music to compose an opera. But, as it is true that even with a knowledge of music one may be unable to compose, so likewise a knowledge of flowers does not necessarily include the gift of designing artistic landscape effects.

The wide range of plants which in the present day can be used in landscape architecture, the equally numerous varieties of situations which the designer can be called upon to deal with preclude what may be termed, the practical side of this question being touched upon in this paper. Nor, as previously mentioned, is it possible to lay down any fixed rules. Every situation has its own distinctive natural features, with which the artist must harmonize his garden. The fundamental point is to study nature, and it will be found that "Nature never did betray the heart that loved her."

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Sweet Peas.

Quite one of the nicest exhibits at the recent Carnation Show were the Sweet Peas grown and shown by Mr. De Rose, of Gilberton. Substance, size, and purity of colour were present in a marked degree. Mr. De Rose, by the way, is not satisfied to dig his sweet pea plots the usual spade deep but makes it a spade and plus the the handle. There is an old saying amongst sweet pea growers that "the deeper the digging the better the flower." Mr. De Rose's blooms were certainly evidence of its truth.

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Some Beautiful Climbers.

From "The Australasian."

If a pure white flower, deliciously fragrant, is wanted, the Mandevillea suaveolens from Buenos Ayres cannot be surpassed. It is deciduous, and should be pruned back like a grape vine every season. There is only one species of Mandevillea, but growing over the curator's cottage in the Hobart botanic gardens is a plant which has much larger flowers than are usually seen; the late Mr. Abbot raised it from seed, and it should be perpetuated. The large clusters of pure white blossoms are sometimes followed by long, narrow, curiously shaped seed pods. The plant is subject to attacks of red spider, but syringing and sulphuring will keep this pest in check. For verandah work the Mandevillea is well adapted.

One of the choicest greenhouse climbers is the Stephanotis floribunda; it is occasionally found growing in the open air, but only in the warmest situations will it succeed. It is a native of Madagascar. It has large thick leathery leaves, and deliciously fragrant pure white flowers which are much esteemed and always in demand. For a wall having a northerly exposure this beautiful evergreen climber should be tried.

Amongst the Thunbergias are found some lovely climbers. The annual kinds, such as T. alata and T. alba, are very distinct and showy, but the plants are subject to insect attacks, hence, some persons shun their cultivation. Some of the Fijian islands are over run with these pretty plants. A rare species is T. Harrisi; it has handsome pale blue coloured flowers. It is by no means a common plant. It requires a warm sheltered position.

The "Carolina Jasmine" (Gelsmium sempervirens) is an evergreen climber of a moderate habit of growth, and bearing very pretty yellow blossoms, which are sweet-scented. Suitable for verandah work, and it also looks well when permitted to run wild amongst trees and shrubs.

A remarkable genus of plants are the Aristolochias. The flowers of some of them are remarkable for the oddity of their form, and for their large size. A Cordata is said to have blossoms measuring 4ft. in circumference, and which the Indian children place over their heads as caps. A. Serpentaria is esteemed in the southern states of America as a cure for the bite of the rattlesnake or of a mad dog. A. Sipho has very large, heart-shaped leaves. The flower is curved like a siphon. It is sometimes called the "pipe-vine," from a resemblance in the form of the flowers to that of a tobacco pipe. Where a rapid grower is wanted for covering an old building, or tree stump, this plant is very suitable. A. Goldieana is a very rare plant. Its three-lobed flowers are over 2ft. in length, and 1ft. wide, of a chocolate red colour, with yellow mottlings. They emit a foetid odour; therefore, the plant should be kept well away from the dwelling house. Some half dozen species of Aristolochias are found in the Melbourne Botanic Gardens, but our local nurserymen have neglected to cultivate these singular plants.

The Lapageria rosea is one of the most glorious climbers in the world. It is a native of Chili. It cannot be recommended for general planting. It may be reckoned as one of the most fastidious plants to cultivate that we have, at the same time one of the most magnificent. It requires a cool, shaded position, and a deep well-drained soil. A friable loam, with some fibry peat and leaf-mould in it if possible, with plenty of sharp sand and broken charcoal to keep the whole open and porous, makes a suitable compost for these plants. A large root-run is necessary, and a disturbance of the roots is resented. Slugs are fond of the young shoots in the spring; these sometimes come up as big as a man's finger, and develop a growth of a dozen feet or so in a single season, but occasionally the plaint remains almost dormant for a whole year. A cool, southerly exposure is the best, but Lapagerias are also grown in pots in the bush house, when grown in this manner, they should be repotted very seldom, but fed from the surface by rich top-dressings. The white variety of L. rosea is as beautiful as the type. The plants are slow to propagate, hence they are dear.

The Bignonias or Tecomas comprise some of our best climbers. T. Jasminoides, with its pretty glossy green foliage and showy white and rosy-purple flowers is one of the best. T. capreolata is orange and red, a free bloomer. T. chirere is a very showy species, but a trifle tender. T. venusta has rich orange yellow trumpet-shaped blossoms, which are most freely produced in late winter and early spring; it wants a warm situation. T. Mackeni is a glorious evergreen climber, with large rose-lilac flowers, veined with purple. T. Lindleyana has large leaves with handsome lilac flowers. T. Tweediana has rich golden yellow flowers. T. Latrobei, a native plant, has fine glossy foliage, with cream-coloured flowers. There are several other species and varieties, and all are successful plants.

The Bougainvilleas are a superb lot of climbing plants; but they are less hardy than many others. For warm situations they are indispensable. Some are of rapid growth, others are best treated as shrubs. They come from tropical South America, but some of the finest are hybrids. The richest colours are found amongst them. Royal purple, magenta, mauve, violet, red, and colours approaching to scarlet, are the prevailing colours. Glabra, magnifica, Cypheri, and Trailli are Bouganvilleas which may be grown in the shrubbery border if well sheltered; the more rapid growers, such as spectabilis, must have a wall or fence. Beautiful as these plants are in the neighbourhood of Melbourne, they are still more handsome in warmer climes.

Canavallia Bonariensis, a leguminous evergreen, fast growing climber, has showy rosy-purple flowers, which, as the plant attains age, are freely produced, and are succeeded by large pods, with bean-like seeds inside them. Not adapted for a cold, exposed place.

The Tasconias comprise some of our showiest climbers; they are most rapid growers, almost too rampant for the verandah, but suitable for fences, old buildings, dead trees, etc. Some are winter bloomers, and they are all very showy. All are evergreen. When the plants are young, they are liable to injury by frost; but adult specimens are pretty hardy. T.

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xoniensus is rosy pink, and one f the best; T. Morti is magenta ; . manicata is the common “scar- t passion flower,” but it is often shy bloomer ; T. ignea is an in- ense scarlet ; T. Van Volxemi is rimson ; T. mollisima is pink, and s fruits are edible.

Passifloras and Tacsonias are osely related. One of the best is . Imperatrice Eugenie, blue and hite ; P. edulis is the common itable passion fruit, it has glossy reen foliage, and white flowers ; . Constance Elliott is white ; P. ragrant Beauty is very sweet ented, flowers white with choco- te centre ; P. quadrangularis (the ranadilla vine) will only succeed a very warm place, and the ume must be said of P. Buona- arti, the handsomest of the whole mily ; it has beautiful foliage, d its large flowers, of beautiful lours, are deliciously scented. his truly handsome plant is well orthy of house culture.

The Maurandyas, white, rose, and urple, are elegant plants. Lopho- ermum scandens is a showy imber, with foxglove-like flowers. tigmaphyllum ciliatum has ex- isite foliage, and singularly aped yellow blossom. Rhyncos- ermum jasminoides is a fine ever- een, with white flowers, very agrant. Loniceras, or “honey- ckles,” the extensive family of lematises, the “snail flower” haseolus caracalla), Sollya hete- phylla, blue flowers, with dozens other plants, are more or less orthy of cultivation when climb- s are wanted. A moderately rich d well-drained soil will suit the eat majority of the plants men- oned. If there be no border in hich the plants can be placed, rge flower pots, tubs, or boxes ay be used.

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Raising Seedling Roses.

In theory it is a simple thing raise a new rose, a mere mat- r, says the “American Florist,” placing the pollen from one se bloom upon the matured igmas of another ; albeit, in tual practice, in the search for llen, in the timing of the vari- ties, even in the germination of e seeds, considerable ingenuity d patience are required. But ese difficulties are not to be mpared to those which arise hen we come to consider the estion of the mating of vari- ies, for it is in the faculty of nceiving a particular end, and in scerning how that end may be hieved, that the essence of successful hybridisation lies. The raiser of new roses must be able to divine qualities more or less latent which, by crossing, may be developed and improved.

When it is recollected how in the past so much has been left to chance, we see how vague and uncertain the indications are on which to depend, and it is then not surprising that so many first crosses give results so much at variance with the raiser's expectations. It is only as he gradually progresses through successive hybridisations that he finds certain tendencies become confirmed, and it is only then that he obtains control and can modify materially these tendencies at his will.

An example of what can be done on these lines will not, perhaps, be out of place here. When M. Pernet Ducher, now perhaps the supreme exponent of rose hybridisation, began his scheme, for a new race ,of hardy yellow roses, he seems to have commenced with several simultaneous crosses of a tentative nature, including the almost daring one of Persian Yellow, and Soleil d'Or, and following along these lines, parallel at first, then converging and combining, he evolved that fine race of yellow roses which possesses the habit of the best hybrid teas with the depths of colour of the Austrian briars.

In a wider field the many fine novelties of the Messrs. Dickson, with undoubted signs of descent from previous hybrids, show in their growth and habit characteristics peculiarly their own.

The National Rose Society is to be blamed that in the past it has, in an inordinate desire for conventionality of form, so completely ignored colour and perfume, the two most charming attributes of the rose, and it is only in the last two or three years that wiser counsels have to any extent prevailed. Here there is a field which still remains fairly open, and it is suggested to the amateur hybridiser that he goes back to the species and old-fashioned varieties amongst which to work. Several of the most beautiful kinds of late years, kinds whose greatest charm lies in their distinctness, are first crosses with a species, i.e., those hybrids with Rosa Wichariana, whose introduction has added a new feature to our rose gardens; Una, one of a batch of seedlings from the dog rose, crossed with tea roses ; the Penzance briars ; and the beautiful Anemone, a hybrid of R. sinica and R. indica, are evidences of the gains to be in this way obtained.

The work will be long and tedious, with many failures, for seedlings have a habit of dying off, and it is an unhappy sight to watch the slow decline of a potentially valuable nurseling. Yet to create a new rose which is a distinct advance is worth more than all these troubles and pains.

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Lawns.

Fungus growths sometimes disfigure lawns, bowling greens, etc., and it is difficult to kill without injuring the grass. The most effective way is to dig it out, cart away the soil in which it is growing, replace with fresh soil from other parts, and sow seeds again. The following remedy appears in the “Garden” ; it is said to have been quite effective :—Dissolve two quarts of flowers of sulphur and two quarts of quicklime in three gallons of warm water, adding afterwards three more gallons of water. Let it stand until quite clear, and pour into another vessel, leaving the deposit behind. Water the infected parts with this ; the fungus will disappear, and the grass be none the worse. The grass must be well watered with the solution.

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How to Bud Roses.

First, the would-be budder must purchase a pruning knife, which consists of a specially curved blade and thin handle, the latter being used to separate the bark from the wood. A supply of raffia or raffiatape completes the equipment, and on a suitable day he may sally forth to obtain the buds required. Select a shoot from which a Rose has been recently cut, as this is usually in the condition of ripeness required, and see that the buds in the axils of the leaves are nice and plump, but not too forward—that is, not started into growth. Having cut the shoot, proceed to sever the leaves about an inch above their junction with the stem, as the base of the leaf remaining acts as a shield to the bud. Now insert the blade of the budding knife about half an inch below the bud required, and draw upwards in such a way that when beneath the bud the blade is one-eighth of an inch below the base, and gradually approach the surface so that the edge of the blade shall emerge at the same distance on the upper side of the bud as it entered on the lower. You have now a

— Boat-Shaped Piece of Wood —

with the bud in the centre. Holding this slip firmly between the finger and thumb of the left hand in an inverted position, insert the end of the handle of the knife between the wood and the bark, and give a gentle twist. If everything is favorable, the piece of wood should fly out, leaving the germ at the base of the bud behind. This is the only really difficult process in budding, and requires a little practice to do it expeditiously. Keeping the bud moist, proceed to make an incision on the selected stock 1 inch in length, just cutting through the bark.

The Shape of a T

and lift the bark on either side with the aid of the handle of the budding knife. If the sap is running freely this is easily done. Now slide the bud, pointing outwards until it just fills the place provided between the bark and the wood which it will do if the measurements given have been adhered to. All is now ready for the tying in. This should be done firmly but not too tightly, commencing by the stem and working upwards, crossing the raffia on the under side of the lateral until the whole length of the cut has been bound up, leaving only the bud itself exposed, and finish off with a neat knot, and the operation is now complete. The removal of the wood from the bud is not really necessary, many expert breeders do not trouble to do so.

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Hybridising Sweet Peas.

Sweet peas are very easy flowers to cross-fertilise. Select a spray of blossom, and set to work to dissect one of the peas, so as to get an understanding of how the ovary, stamens, and pistil are arranged. You will find the whole of these reproductive organs enclosed within the centre part of the flower. Strip the petals off, and the embryo seedpod is easily seen within its silvery sheath, from the ends of which start eight or nine stamens. Each of the stamens holds a pollen cup. Generally one is larger than all the others. The pistil is at the end of the ovary or seed pod. Under ordinary conditions the fertilising is done by nature, through the agency of the insects, which in their wanderings from flower to flower transfer the pollen to the pistils.

What you must do is to catch the flower before the pollen is ripe (dry). This is no difficulty. An inspection or two will put you on the right track. Take all the stamens off with a small pair of scissors, and bind the mutilated bloom with a piece of fine muslin. This is to keep insects from doing the work which you have in hand. Next find a flower with the pollen in the right condition. Cut the spike, and bring it along to the one you wish to work. Undo the muslin, get a small camel's hair brush for transfering the pollen, and set to work to place a portion of the yellow powder on the pistil. Ever so little will do. It is not necessary to waste the whole of the pollen on one operation. After the fertilising tie the muslin round again. See that the tie is tight enough round the stem to prevent any insect gaining admission.

Select only very choice specimens for crossing. No use perpetuating the bad habits of the inferior flower. Dull colours, weak growth, and small petals are all faults. Find the blooms that have a lot of open-heartedness and plenty of perfume, and lots of bright colour. These will improve your pea stocks. Work selfs rather than "striped kine," and don't be afraid of crossing two of a somewhat similar shade.

Label everything, and, if possible, note the colours worked. Let this season's experiments be on a small scale, rather than an extensive one. As you go you will gain in knowledge, and know better how to work. One advantage of working peas is that you see the results of your labour within a year.—"The Amateur Gardener."

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Propagating Roses.

The propagating of roses by bud grafting, instead of by the ordinary method of budding, is, says a correspondent of the "Gardeners' Chronicle," making its way amongst many old rose cultivators in various parts of the continent of Europe. A short description of the modus operandi may be interesting to many of our readers.

When one considers that the sap does not rise in the bark of the stem, as has been erroneously supposed, but in the wood just beneath it, and that in bud-grafting the eye or bud comes into direct contact with the wood, it is readily understood why bud-grafting is so successful in most instances; the losses do not amount to more than 5 per cent. The operation is more quickly carried out than budding; the bud runs no risk of injury, as by pushing it into place in budding. In the case of failures, there are no ugly scars, and every stem can be grafted, whether the bark will "run" or not. The operation consists in making a slanting incision in the stem or branch, and then with a second cut removing the rind, and a very little of the wood. In this cut the bud is placed, after cutting to fit exactly. That done, another cut can be made on the opposite side of the stem, and a second bud inserted at the same height. Both buds are now bound in with bast or worsted, beginning at the bottom, the short end laid on the stem or shoot, and the longer end used to encircle the buds, binding fairly tightly immediately below and above the bud. The buds being now bound in, the short end and the longer remaining end of the bast can be tied in a knot. This kind of rose grafting bids fair to become quite common.—Leader.

Rose Growers Criticised.

It is so much the fashion to hear the Rose and all connected therewith praised and extolled that one is apt to forget that there is any other side to the question. An English paper, however, puts forward this other side as follows:

"The rose which flowers in late summer and autumn is a new thing, and certainly we cannot thank the florists too much for it. Still, it may be good for him to ask him a few fundamental questions in the midst of his triumphs, and the first question we would ask is, What object he has before him when he produces a new rose? Does he work, like some wild poet, without a conscience or an aim; has he the rose show in his mind, or has he the garden? He will probably answer both, and will add that the show is only an adjunct to the garden; and this is certainly what it ought to be. Rose shows are very delightful things, but we cannot have them always with us, like gardens; and when we visit them we ought to go with the object of discovering what roses, new or old, are the most beautiful garden plants. It stands to reason that the show should exist for the sake of the garden, and not the garden for the sake of the show. What are we to think of the ordinary garden of a skilful rosegrower? Take, for instance, such a rose as Frau Karl Druschki, the great triumph of the florists and the glory of exhibitions, which is described in catalogues, and, accurately enough, as having enormous flowers perfect in symmetry and of the purest white. If we see one of these flowers picked we cannot but wander at its beauty; but when we see the whole plant growing in the garden, if we wonder at all it is still at the beauty of the individual flowers; for every spring the plant is pruned back close, so that it may have vigour enough to bear its huge blossoms, and, therefore, it never has time in the course of the summer to show its true character as a shrub. But, further than this, it grows rather stiffly by nature, though less stiffly than some other hybrid perpetual roses, and its great flowers, instead of being borne on swaying and trailing branches, are carried on short, straight stalks. We have taken Frau Karl Druschki as the finest example of its kind; but there are many other show roses far uglier in habit and with faults which Frau Karl Druschki does not possess. The serious rose grower is apt to think of the rose as a flower, and not as a shrub, and so long as he does that he will never have a beautiful rose garden. It is too much to expect, of course, that rose growers should give up their present system of cultivation at once and altogether. Many of our finest modern roses require to be pruned back hard every spring, so that they may give all their strength to the production of their splendid flowers. But this hard pruning is practised far more than it need be, practised, indeed, upon roses which would bloom freely enough if they were scarcely pruned at all, and would be far more beautiful objects in the garden. And it has come to be so practised because roses are considered only for their flowers, as fruit trees are considered only for their fruit. We prune the fruit tree without any thought of its beauty as a tree, and rightly. But in pruning the rose we should think always of its beauty as a shrub, and when a rose will not blossom well, except when it is pruned out of all beauty of habit, then we should consider it an inferior plant, and grow it, if we grow it at all, in some back part of our garden among the plants that are used for cut flowers.

Few rose gardens at present are beautiful themselves, though they may contain many beautiful flowers, because they are apt to consist to a great extent of roses that have to be pruned out of all beauty of habit, and also because the roses in them are cultivated in a manner which makes beauty impossible. Standard roses are well enough in their place, in a border, for instance, rising occasionally above an undergrowth of other plants; but the serious rose grower usually avoids such an undergrowth, because he fears that it will exhaust the soil and prevent his roses from bearing the finest possible blooms. He therefore plants his standards in batches in plots of bare soil. Nothing can look more gaunt and forlorn than a number of standards so grown, when they have just been pruned hard back, and even when they are in full bloom they have no beauty except in their flowers. Even dwarf roses grown in this way are apt to look as if they were in a nursery garden; and for more than half the year they are scarcely less ugly than standards. Thus one result of all these wonderful novelties, of all the florist's industry and skill, is that the rose garden is usually not so beautiful a place as it must have been a hundred years ago, when it was filled with damask and Provence roses and the old white rose, free of growth, and, even when not in flower, beautiful all through the summer by reason of their leaves, which are much more abundant and of a much lighter green than those of most modern long-blooming roses. We cannot, however, expect gardeners to go back to these; nor can we expect them to fill their rose gardens mainly with the beautiful species recently introduced or with the rampant-growing Ramblers and other roses; for most of these, too, only blossom once in the year, and we are all ready to make a good many sacrifices for the long-flowering roses. But, without rushing to extremes and condemning these roses altogether, we can recognise the fact, which is still almost entirely ignored, that it is a serious defect in a rose that it should require to be pruned out of all beauty of habit before it will flower well; and when once this fact is generally recognised, when roses are grown more for themselves than for their flowers, there is a great hope that we shall get a race of roses far superior to any that we have now.

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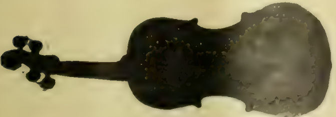
"Well, Rastus," said an American evangelist to a coloured disciple, "I hope you are now trying to live a good life in accordance with the rules of the church. Have you been stealing any chickens lately?" "No, sah, I ain't stole no chickens ob late." "Any turkeys or pigs?" "No, sah." "I am very glad to hear that," commented the evangelist. After the meeting was over Rastus drew a long breath of relief, and, turning to his wife, exclaimed, "Gee! If he'd said ducks I'm been a lost nigger, suah!"



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Vegetable Garden.

Notes for December.

The man who sets out to provide the family table with vegetables is not having the best of times this season. Apart from the weather which might certainly be considerably improved upon, from the gardener's point of view, one has to reckon with thrips, red spider and assorted beetles, a sufficiently serious trinity. There is always something. In a moist season fungus troubles will generally put in an appearance whilst during a dry one the red spider often makes himself more perfectly at home. For the thrip benzole emulsion is probably the most satisfactory remedy. Mr. French, in his "Destructive insects of Victoria," recommends its use at the rate of one in six. Tobacco water, kerosene emulsion, are also good. One of the best is Gishurt's Compound, but except for small patches this would be somewhat expensive. For the red spider, whose presence will be shown by the spotting and yellowing of the leaves of young cucumber, melon, and bean plants, dusting with flowers of sulphur is certainly helpful. Keeping the plants moist is also a safeguard as fortunately this insect objects to such conditions. For bugs and beetles which chew there is nothing better than a dose of arsenate of lead.

With such an array of possible enemies the gardener may be excused for a little temporary discouragement—there are, of course, others, to wit, mildew and rot, for which Bordeaux Mixture must be used—but he may be assured that with a little assistance in the way of remedies his plants will pull through and give a big return for his time and trouble.

Work in the vegetable garden will, on the plains and in hot districts consist chiefly of watering, hoeing—the more you hoe the less you need water, though a lot of both is best—and where possible mulching with stable manure. Seed sowing for the time should be confined to small lots of suitable salad plants. A row of French beans, which, if pushed along and they are not worth growing otherwise, will be in fruit well under the two months. A hole or two of cucumber to carry on the succession and at the end of the month a small sowing of cabbage and cauliflower may be tried. One of the items in growing vegetables is the liquid manure can. Even in ground already well manured this will be found to give good results. Any plants which are not making thrifty growth will be helped by nitrate of soda or sulphate of ammonia, half an ounce to the square yard once a week till they begin to rush along. An equal quantity of sulphate of potash and twice the amount of super at the same rate will be beneficial. Half a kero tin of poultry droppings will make 16 to 20 gallons of good tonic. For the same quantity use twice as much stable manure.

Tomatoes want pleanty of light air and moisture. Comparatively few people grow the tall varieties now. If these are not trellised or staked they should at least have a few boughs placed so that the fruit will be held up and the plant kept as open as possible. For mid season fruiting this plan of growing has much to recommend it, especially where water is not too abundant, for the plant shades the ground which tends to keep it moist. Dwarf growing, sparse foliaged sorts are no doubt best for early plants, but in mid-summer a lot of fruit is spoilt by sun scorching. Where fruit is well set the watering should be much increased, in fact a fruiting plant will benefit by any reasonable amount of water. It is not too late to put out seedlings. In the Hills work in the garden will consist of a continuation of last month's operations.

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The Influence of Sea Air.

There appears to be no doubt that nearness to the sea coast influences the scent of vegetation, says a writer to the "Garden." The great European flower farms for perfumery lie in the valley of the Var, a great triangular space of 115,000 acres, with Grasse at its apex and Nice and Cannes at each corner of its base on the Mediterranean. Here orange-flowers, violets, roses, and other flowers are not so much sold in the bunch as weighed by the ton, and their fragrances are sent all over the world. Nor can we forget the aromatic herbs and bushes that clothe the little capes that jut out into the great sea which washes the shores of Italy, Greece, Sicily, and Corsica. Napoleon said he should know his native land with eyes shut, from the scent of a little white Cistus (C. monspeliensis), that scents the air after rain with its resinous odour. Corsica is covered with it. And there are the spice islands of Java, Ceylon, Borneo, and the Windwards, all aromatic with spieces—clove, cinnamon, and nutmeg. Douglas Sladen, in his delightful book "In Sicily," says the island is "one vast herbarium. In every old wall, on every uncultivated patch, grows some medicinal herb." It is powdered with sweet wild flowers and fragrant trees and shrubs. Another traveller in the islands of the Greek Archipelago describes how at a distance they look bare and arid, yet have a scattered growth of lovely sweet-smelling bush and herb, so that as you move among them every plant seems full of sweet sap or aromatic gum, and as you tread the perfumed carpet the whole air is scented. Here, too, are dusky groves of incense-bearing cypress and myrtle, of oleander and sweet bay. Roses, honeysuckle, jasmine, and even the primrose, have a deeper scent when grown near the sea. Herbs are certainly more pungent and aromatic by the sea than inland. Vegetables, we think, gain in flavour from being grown near the coast.

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Nitrogen as a Fertilizer.

The effect of nitrogen on a plant is very marked. It promotes a rapid growth of leaf and stem, and tends to produce a large green, succulent plant. While a plant is in this condition, with a large supply of available nitrogen present in the soil, the formation of buds and flowers is retarded, and the flowers are not only diminished in numbers but many of them are rendered sterile, so that they produce no seed. A plant which grows up with an abundant supply of nitrogen is also less capable of withstanding a drought, and begins to burn when the moisture supply becomes limited.

Nitrogen does not merely act as a stimulating agent to the plant but enters into the composition of the plant, forming albuminoid and other nitrogenous compounds. Plants grown on a soil well supplied with nitrogen are much richer in the above compounds than those grown on poor soil.

It is highly probable that nitrogen must be in the form of a nitrate before a plant can make use of it. In the soil there are a great variety of micro-organisms, and some of these have the power of converting various substances, containing nitrogen, into nitrates, so that most nitrogenous compounds when applied to the soil are acted upon by these bacteria, and through this vital agency, are converted into nitrates. For the nitrogen of fertilisers we are dependent upon sodium nitrate, sulphate of ammonia, or various organic compounds, such as blood, bone, cotton seed meal, tankage, fish scrap, etc. It will now appear that the source from which the nitrogen of a fertiliser is derived is a matter of great importance. If nitrate of soda is used all the nitrogen is immediately available. If sulphate of ammonia is used it may become rapidly available on certain soils, slowly available on others, and on still others it may exist in an unavailable form so long as to be useless to the crop for which it was applied. In the case of the organic substances we find the nitrogen of some more readily converted into nitrates than that of others. Much depends upon the nature of the soil and the kind of bacteria present. We are just beginning to appreciate the importance of the action of these bacteria, and we may expect far-reaching results from investigations along this line.—Queensland Agricultural Journal.

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The Champagne Vintage.

Mr. Charles Heidsieck forwards us his usual yearly report of the champagne vintage as follows:—

"As I have had the pleasure for many years of sending you a short report of our Champagne Vintage, I trust your readers will be interested to hear something of the prospects of this year's wine. In my pervious letter for 1910 I had unfortunately to give a most dismal account of the Vintage which, owing to incessant rain was a complete failure. Happily for the country the glorious and brillant weather of the year has done an incalculable amount of good to the vines. The young wood has grown to maturity dispersing our fears for next year—(for it is on previous years' wood that the grapes grow) and the vines themselves have thriven splendidly. Unfortunately "Il n'est pas de roses sans epines" as we say in France. Owing to the heavy rains of last year the old wood of the vines was very weak and in consequence bore this summer a small quantity of fruit. Cold and rainy weather at the end of June and later on, the excessive heat and want of rain seriously diminished the crop, so that the quantity is about one fifth to one sixth of an average vintage, nevertheless it is many years since we have seen the grapes in more perfect condition, so very rich and sweet. It is practically impossible to formulate now an opinion of the actual character of the wine, but it will be undoubtedly very good; unfortunately the quantity is too small to add much to our limited stock. The present healthy conditions of the vines encourage us to believe that the next years' vintage will be more satisfactory."

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"Where are you going, mamma?" asked three-year-old Lawrence. "I am going calling," replied the mother. "Are you going to take the baby?" asked Lawrence. "Yes." Lawrence studied a moment, then asked, "And will he holler, too?"

Fumigation

As fumigation for Red Scale on citrus trees is now compulsory many amateur gardeners not to mention a number of large growers, will either have to do the work themselves, pay other people to do it for them or grub out their trees. The fact that the chemicals employed may through want of knowledge or careless handling be exceedingly dangerous to the operator has no doubt told considerably against the more general use of this most effective method of scale eradication. Another objection is the fact that to accurately guess the volume of space enclosed in an irregularly shaped figure, as in the case of a covered tree, is pretty well an impossibility, whilst, even granting that, generally speaking, it approximates to the regular figure of a hemisphere placed on top of a cylinder, the taking of measurements and the working out of the mathematical formulae to determine the cubic capacity is not an easy matter. Sometimes this difficulty is overcome by having tents of different diameters ruled with a series of parallel lines on which are marked the dose to be used when such line is at ground level. The apex of the tent, of course, to be above the centre of the tree and the circumference fitting around it somewhat closely. When sheeting, as with large trees is employed this method is not applicable. With small trees up to six feet high, the amateur grower will probably prefer to do his own work, and for such trees a light framework of battens and laths covered with oiled calico or stout paper can be used and the work is quite simple for a fixed dose according to the volume of the frame will be used. Thus a frame 4 ft. x 4 ft. will have a cubic capacity of 64 ft. and will require ¾ oz. cyanide, 1 oz. sulphuric acid and 2 ozs. of water. For a tree covered by a 5 ft. x 5 ft. frame the dose would be 1 oz. each of cyanide and sulphuric acid to 3 ozs. of water whilst for a 6 ft. x 6 ft. frame with a capacity of 216 ft. the proportions should be 1¼ cyanide 2 sulphuric acid and 4 of water. As a way out of the difficulty of measurement the novice in this work who wishes to do a few larger trees by the sheet method, should send the dimensions, height and circumference, to Mr. Quinn at the Department of Agricultural, who will, no doubt, supply the requisite information. Much greater accuracy will be attained if each tree is temporarily covered and the measurements then taken. As there is some considerable margin between a strength sufficient to destroy the scale and that which would seriously injure the tree, the use of the minimum effective quantity, is not, to the man with a few trees, a matter of very much importance but he must be careful to use enough. To large growers, however, any unnecessary cost, even if it amounts to only a few pence per tree, is an item worth consideration.

The most practical aid to the grower which we have come across in this matter are the complete tables published by the Fruit Expert of New South Wales, in the March 1911 issue of the Agricultural Gazette, in which Mr. Allen gives the quantities necessary, in two strengths, for practically every size and shape of tree the orchardist will be called upon to handle. The modest sixpence charged by the N.S.W. Department will be well expended in the purchase of a copy by anyone interested in the subject. In an article which accompanies the tables Mr. Allen discusses the practical side of fumigation at some length and it is from this scource that we quote the following extracts:

"Among some of the causes of failure which have come under my notice and which, wherever it has been possible, I have made a point of finding out, are:—First—under-estimating the size of the tree; second—fumigating at the wrong time; third—neglect to see that the tents were free from holes; fourth — carelessness in weighing the cyanide; and fifth — an insufficient quantity of sulphuric acid to dissolve the cyanide.

This treatment, like any other, requires to be carried out carefully and systematically, and there must be no trusting to guesswork.

"With reference to those cases where fumigation has not proved entirely satisfactory, owing, as I said before, to under-estimating the size of the tree, I might say that in measuring the tree it is necessary to get the extreme height and width, as if this is not done, and in consequence a smaller charge applied than the tree should really have, the scales may not all be killed.

"It is easy to ascertain the size of the trees by using a pole with, at intervals of every foot, a distinct mark printed or cut in it, so that all the operator has to do is to hold it up to the tree and find out the extreme height and width.

"The work, as I said before, is best done at night, as there is less danger of harming the tree, even if the charge is a little heavier than it should be. If this were done in the daytime, or even the ordinary charge used if the day were hot, many of the leaves might be removed and some of the small twigs burnt. Therefore, as far as possible, do the work at night, late in the evening, early in the morning, or on cool, cloudy days, but never, by any chance, during the heat of the day.

"Lemon and mandarin trees, it is found, stand the fumigation much better than do oranges assuming two trees of equal size and treating them with the same charge.

"Always see that the tents are patched and free from holes before starting to fumigate, otherwise the holes provide an escape for the fumes, and the work is not done properly.

"Great care must be taken to have the chemicals accurately measured out. I have seen some operators at work who exercised care in weighing out the cyanide and measuring the sulphuric acid (which latter is, of course, liquid measure), and yet the cyanide was not dissolved. The trouble in this case is that the sulphuric acid was not up to strength. In such cases a greater quantity of the acid must be added until sufficient is given off, so that upon emptying the generator it is found that the cyanide is throughly dissolved.

"On the other hand, I have heard of certain growers who have dispensed altogether with the use of the scale and measuring glass, and simply guess at the quantities required. Is it any wonder, therefore, that we read of a tree being killed occasionally; or that with those who will not exercise the precautions impressed upon them, fumigation has turned out unsuccessful?

"If sufficient cyanide, sulphuric acid, and water are put in the generator and placed under an air-tight tent, the scale insects on the trees so covered are bound to be killed; they cannot escape, unless perhaps an odd one which may be protected by a fold of the tent, or between a few leaves which may be pressed together by the weight of the tent.

"The water is first poured in the basin or generator, then the sulphuric acid added slowly, and the generator placed well under the tree and away from the tent, so that when the cyanide is dropped gently into the vessel there may be no danger of the contents splashing on to the tent.

"When the tent is over the tree, and the sides, with the exception of one place, are held down by earth, put in the vessel containing the water and sulphuric acid, well under the tree, and then by inserting the arm through the loose part of the tent and holding the material close, drop in the cyanide and withdraw the arm throwing some earth on the loose canvas to hold it down.

"The trees should be allowed to remain covered for forty-five minutes

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(late of Old Queen's Arms, Wright Street).

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as It has been found that in that ime all scales are killed, and the work is beyond doubt properly done.

"When large quantities are used, it s best to divide the charge, using wo generators in place of one, and place either a board or tin over the enerator and a few inches above it, o as to spread the fumes which might therwise prove too strong for the eaves and twigs immediately above hem, some of which might be burnt. As a matter of fact, it will be found dvantageous to place this board or overing over the generator at all imes, as it helps to spread the umes."

There appears little too add to the bove except to impress on the novice hat he is handling two dangerous hemicles, but which may be handled ith perfect safety. There should be o guess work. In combining the hemicals, but which may be handled ng glass should be used. First easure the sulphuric acid and place t in any earthern ware vessel, bowl r jar, which has already been placed n position under the tent, then easure the water and pour it gently ver the acid. A little steam will be bserved to rise but this is not harmul. Next drop in the cyanide. It s best to weigh this out before hand nd wrap each seperate dose in paper r small calico bag. Directly the yanide touches the water there will e considerable bubbling and agitaion of the water and a thick cloud of ungent smelling vapour will be given ff. This is the hydrocyanic acid gas hich destroys all animal life present ithin the tent. Immediately the yanide has been dropped withdraw he arm and close down the opening. e have known some extra careful eople who use a long handled ladle r dropping in the chemical. If the overing of the tree is made of porous aterial considerable gas will escape. his is a waste of material, it may lso defeat the object in view by educing the strength of the dose elow the effective point and it will ertainly give the operator a rather ad headache if he inhales much of it ven in this diluted state. The same esults will follow any holes in the aterial, also failure to pack loose arth around the bottom of the box r sheet. Finally we might suggest at when fumigation is to be done, e children should be put to bed or therwise disposed of before beginning, e family cat locked up and care aken that one's treasured fowls are ot roosting in any of the trees to done.

◆

Watering Fruit Trees.

Reply to "Unley Amateur."—No mount of summer watering can take e place of good soaking rains in inter. If these have fallen summer atering needs to be done carefully r the trees may be forced to make o much growth and to continue oing so too late in the season. This especially so in home gardens where nsiderable watering of vegetables is one. This season has, however, been so unusually dry that there is little danger of overdoing the water. To get fine fruit an abundance of sap is necessary and this is particularly required, first when the fruit commences to grow, and secondly when it swells before ripening. You will have noticed that there is a marked break in the rate of growth, it is at this time that the kernel in stone fruit is forming. Watering then is a matter to be judged by the state of the fruit rather than by any fixed date or any other arbitary rule. One good watering, by that we mean as much as the ground will hold when the early ripening sorts are beginning to swell, will probably be all that is necessary and bear in mind that it is never wise to heavily water a tree on which the fruit is close to full ripeness, for fruit so treated will neither keep, carry or taste as well as it otherwise would. For later season sorts of peaches give a moderate watering when the trees show the least sign of wanting it, and a heavy one at the same stage of development as in the early sorts. Keep the ground well stirred so as to create a shallow soil mulch or place a layer of manure, hay, straw or seaweed around the tree to the full extent of the spread of the foliage. The young trees should be kept growing, so give as much as they want as often as they want it. As to the oranges, lemons, etc., give them a soaking once a month through the summer.

◆

Hoof Parings.

At many a smithy may be seen a heap of horse-hoof parings, and these are generally wasted, their value to the gardener not being known. A note in the "Journal of Horticulture" says that these parings form a good manure to fruit trees and vines, and especially on sandy soils, where by their slow decay they will yield a gradual supply of nitrogen, as 100lb. of hoof contains from 8lb. to 12lb. of organic nitrogen and from 6lb. to 10lb. of phosphoric acid. For comparison, we may say that 100lb. of bone meal contain 32½lb. of organic matter, 24 lbs. of phosphoric acid, 24½lb lime, 1lb. magnesia, and 4lb. of nitrogen. One's own inferences may be drawn as to the value of hoofs compared with bones. The hoof parings also generally contain a large proportion of manure. Such are best thrown into a heap, say, five or six barrow loads, and sprinkled over with sulphate of potash, and protected from wet. The heap in the course of six months will form a good manure, and may be used in the proportion of about one-tenth of the loam forming the border, say one cart-load of the hoof manure, two cart loads of old mortar rubbish, one cart load of unleached wood ashes, 2cwt. or 3cwt. of bone meal, the above to be mixed with ten cart loads of turfy loam.

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SPEAK OF
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BECAUSE IT MADE
A NEW MAN OF HIM

Many thousands of persons suffer from stomach and liver troubles yearly, because they do not use Clements Tonic. For the relief of these, and for Brain-fag, Loss of Sleep, Indigestion, Constipation, Palpitation, Sickness after eating, Sick Headache, this medicine never fails to benefit. Get it and health at the same time. Mr. Radcliffe writes:—

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"We who lead a busy business life, write letters only when it may lead some unfortunate to recover their health, I think it my duty to do so now. I became regular run-down, debilitated, and thrown completely out of gear and quite unfitted for business with that unrest feeling and want of sleep. I fell into a weak nervous state which retired me from business. I have walked around the store wondering how in earth I was going to get through the day, and yet such a number of people calling asked for Clements Tonic, yet it never occurred to me to take it, but when I did, my troubles soon vanished and I was another man. You may print and circulate this in any way."

(Signed)
WILLIAM M. RADCLIFFE.

The herald of good and lasting health, this medicine must be a part of your home. What is better than health? Clements Tonic rapidly relieves indigestion, weakness, constipation, weak nerves, poor sleep or appetite. All chemists and stores sell it.

The Neglected Home Fruit Garden.

The following, though dealing with American conditions, is quite applicable to many Australian orchards :—

" How shall I bring my run-down, neglected orchard back to a state of profitable production ? " is a question which, if it were dealt with fully, would probably need as many answers as there are neglected orchards. The very first thing to determine is the reason for the existing unprofitable condition. The reason is neglect, of course, but neglect may lead to a great variety of troubles, and we must try to find out just what the troubles in an individual case happen to be before we can remedy them.

It may be that the land is low and poorly drained and that the trees suffer from spring frosts and " wet feet." If so, that piece of ground was never meant for an apple orchard and the best thing to do is to cut the trees at once and get some good fire-wood at least, and then set out some young trees in a more favorable location.

The trees may have ceased to bear fruit because the land, possibly never any too good, has been called upon to furnish continuous crops of hay or grain as well as to support the apple trees. It has been shown by pretty conclusive experiments that apple trees set at the rate of thirty-five to the acre (which would equal being set thirty-five feet apart each way), yielding fifteen bushels of apples per tree, draw from the soil in twenty crops more than " twice as much nitrogen, half as much again of phosphoric and nearly three times as much potash " as twenty crops of wheat would remove counting grain and straw with an annual average yield of fifteen bushels per acre. Where the trees are compelled to compete with other crops for a supply of food and water, it is no wonder that they sometimes succumb considering the heavy demand they themselves must make in order to make good yields.

Not infrequently the neglected orchard is unprofitable because the trees are so crowded together that there is a struggle for bare distance between one tree and its neighbour. The results of this crowded condition may be seen in the long leggy tops, climbing upward like forest trees, in the struggle for light and air. Such an orchard with the tops out of reach, and the ends of the branches interlocking, is impossible to care for properly and can never be made to yield satisfactorily while in such condition.

Beside the condition spoken of above, there is another whole class of troubles brought about by the omission of those operations of what may be termed orchard hygiene, which are performed by the commercial grower as a matter of course. The trees may be half choked in a thick tough old sod ; this sod is liable to harbor mice and rabbits and the trees may be suffering from their attacks as well as from borers, which thrive and multiply under the conditions furnished by heavy sod close up to the tree trunks. Spraying has very likely not been known to the orchard, and what fruit there is, is scabby, deformed and wormy. Pruning has probably been overlooked, or if it has been done at all, it has been done with an axe in a sort of kill or cure way, which left the trees in worse condition than before.

Much is being accomplished nowadays with these old neglected orchards by renovation. By renovation is meant plowing, pruning, fertilization, spraying, digging out the borers, and in short giving the orchard a thorough house-cleaning.

After the brush is cleared away (and it is surprising to see how large a quantity of prunings a few neglected trees will yield), the orchard should be ploughed and harrowed and the surface made fine. Any one who has broken a twenty-year-old blue grass sod in an orchard will appreciate why the trees suffer from it. A few surface roots may be cut by this ploughing. Never mind but go ahead. Get the ground fine and keep it cultivated till autumn, then sow a cover crop which will protect the ground till it is turned under the following spring.

Along with the cultivation should go a liberal amount of fertilizer. In the use of fertilizer in orchards, you must avoid too much nitrogen. For this reason heavy mulching with barnyard manure is to be recommended only for such orchards as indicate by their small annual growth, and by their scanty and light coloured foliage that nitrogen is lacking. For soils of fair natural fertility and where a nitrogen gathering cover crop, such as clover, crimson clover, cowpeas or vetch may be grown, the following formula is suggested :

A thousand to 1,500 pounds per acre of a mixture containing one part (100 pounds) each of grou bone, acid phosphate, and muria of potash. On soils that a somewhat exhausted, 125 poun nitrate of soda may be used addition.

In order to get the greatest r turns from this fertilizer, it shou be thoroughly worked into t soil. This can be accomplish very well, by applying it to t surface just before ploughing. T ploughing and working of t ground will get the fertiliz pretty thoroughly incorporated a the trees will soon show the ben ficial effect of its presence.

After the neglected orchard h been thus treated, an intellige application of the spray pump w generally complete its cure.— C. Woodbury in Green's Fru Grower.

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Fruit as Food.

An English doctor expresses the opinion that Englishmen could live in better health, and with greater freedom from disease upon fruits and nuts produced in England alone (including cereals and legumes under this title), than on the usual diet. Secondly, he writes, fresh, ripe fruits may be used by young and old alike during the summer, but that juicy fruits should be eaten with a fatty addition—e.g., strawberries and cream, and they should not be largely used in cold weather. Thirdly, sweet, dried fruits may be eaten all the year round, and should be eaten with nut meal. Fourthly, raisins stand at the head of all fruits, and, if soaked for 12 to 24 hours before being eaten, are the finest of fruits for curing anaemia and debility, and for supporting the needs of the body in old age as well as in youth. Fifthly, tomatoes, walnuts, nut-butters, peanuts, malted peanuts, are rich in proteids, and produce most meaty dishes when wisely prepared. Sixthly, apples and grapes should be in every house in the land all the year round, and, when they cannot be obtained, raisins should be used, so that every adult eats 4lb. of apples or 1lb. of raisins per week. Seventhly, nuts are far too little known, but are of immense importance. The newer pine kernels and butter-nuts are readily digestible, whilst most of the other nuts can be used if put through a nut mill, and the remainder can be eaten by nearly everybody if used in their malted form; while the nut butters should replace all the other animal fats for those who love daintiness and immunity from disease. Eighthly, fruits and nuts may be taken at any time of the day if due care be taken in mastication, but if taken with cereals they are better taken early in the day rather than at night. Ninthly, the best adjuncts to fruit are cream, clotted cream, curds and whey, milk puddings, fresh cheese, cream cheese, and honey. Tenthly, by the right use of a wisely selected fruit diet, a large number of diseases, which are caused by excess of protein waste (gout, headache, constipation, debility), can be cured. Eleventhly, by the right use of fruit juices and fruit salines, the deposits which are the causes of old age can be re-absorbed, and youth and activity be perpetuated much longer. Twelfthly and lastly, I believe in the old adage, only in a much more amplified form, that "an apple a day keeps the doctor away," and that it would be to the permanent welfare of England to grow more apples, and breed fewer doctors.

* * *

Crystallised Fruits.

The manufacture of these sweetmeats is quite a simple matter, coming easily within the capabilities of the ordinarily clever housewife, while the expense of preparing them is small. Of the various fruits best adapted to this purpose, peaches, pears, plums, pineapples, cherries, and currants are the most generally used, and are prepared as follows:—Stone the peaches, plums, etc., by making a small incision in the side, through which the seed is slipped, pare and quarter the pears, and cut the pineapple into slices half an inch in thickness across the fruit. Weigh and allow an equal quantity of the best white sugar, make a rich syrup, adding one small cup of water to each pound of sugar. Boil for a few minutes together, then add the fruit and cook gently until clear, but unbroken. Remove carefully on to a wire strainer and let stand about an hour, or until perfectly cold, then sprinkle liberally with powdered sugar, and stand the strainer on a dish in a moderately warm oven for two hours. At the expiration of that time turn the fruit, sprinkling as before with the sugar, repeating the process until the juice has quite ceased to drip, and the outside is dry and crystallised. It is then removed from the oven and allowed to get perfectly cold, before being packed away in small boxes between layers of waxed papers. Thus packed and stored away in a dry place, it will retain its perfect condition for an indefinite length of time. It is perhaps necessary to add a word of caution in regard to overheating the oven, the exact amount required being ascertained by experimenting, since too great a degree of heat will most effectually change a delicious sweetmeat into the toughest of leather.

A. F. TELFER.

Produce and General

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SANTO BLDGS., WAYMOUTH ST.

Why Russet Apples Wilt.

Ever since russet apples have been grown they have had the fault of wilting in storage. It is constitutional with them. Their skin is rough and porous, and not smooth and covered with a coat of wax as all other kinds are. If anyone will scrape the surface of an ordinary apple with a knife he can easily see that a white wax is gathered on the blade. In some cases it is very noticeable and may be gathered into a little ball. This wax may be made to shine by rubbing the apple skin and this is often done by retail fruit dealers and exhibitors at fairs, to enhance their beauty. But it lessens their keeping quality, because of taking off some of nature's protective covering. The russets have almost none of it and therefore their internal moisture or juices easily passes out. The way to prevent the wilting is by storing the apples in a very damp place. But it must be cool as well, or the apples will ripen and rot.—H. E. VanDeman, in Rural New Yorker.

A GRATEFUL LETTER FROM A MELBOURNE SUFFERER, WHO OWES HER LIFE TO CLEMENTS TONIC.

It Would be Safe to Conclude Her Days of Health Were Numbered. Read What She Writes:—

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"CLEMENTS TONIC LTD.

"Out of the fulness of the heart the mouth speaketh, and who would not have a grateful heart to be restored to perfect health and strength if they only passed through one quarter of what I did? The three doctors that attended me all agreed that my case was nervous prostration. Although I had the best attention I got no better. I was then an inmate of three Melbourne hospitals. I tried the convalescent home, was sent to Ararat for change of climate, with no better results. Food and sleep were strangers to me, when a lady hospital inmate advised me to take Clements Tonic. When I had taken two bottles I felt better; my hands were steady, and that longed-for refreshing sleep came to me, and restored me to perfect health. You may use my humble testimony for the sake of women who are ill. "(Signed) ROSE FORD."

Only another letter showing what Clements Tonic can do in cases of nervous prostration, decline, or anaemia. It is the weak, nervous woman's friend, and proves its value in cases of Constipation, Biliousness, Sickness after eating, Nervous or Sick Headache, Indigestion, Palpitation, Lassitude, or Weakness. A timely use of it saves doctors' heavy bills. Send for it, and for health at the same time. ALL CHEMISTS AND STORES sell it.

Fresh Fruit and How to Preserve It.

DRYING FRUIT.

The greatest point in fruit-drying is to avoid drying it too much. It is perfect when no water will press out when squeezed, and it should be quite soft. Fruit that is dried beyond that degree is more or less spoiled.

Fruit cannot ferment unless there is enough moisture in it to squeeze out when it is pressed.

Plums must be perfectly ripe before being dried. As they do not all ripen together on the tree, those that are fully ripe from time to time should be picked. Plums are usually dipped in a boiling lye for four seconds to cause minute cracks in the skin, and thus hasten the drying by several days. The lye is made with 16ozs. Greenbank's concentrated lye in 12 gallons of water. The plums are placed in a wire basket, dipped four seconds, then dipped into a tank of clean warm water to rinse off the lye; next spread upon trays and dried in the evaporator, or upon ordinary wooden trays in the full sun. After they are dry it is advisable to dip them three seconds in pure boiling water, on the surface of which a little glycerine or olive oil is placed. This treatment kills any insects or other eggs, and gives the plums a gloss. They should then be spread on trays and placed in a moth-proof room to dry.

Apples are best peeled, cored, sliced in rings (there is a small cheap hand machine that does all this at one operation), dropped into cold water in which 1oz. of salt per gallon has been dissolved. (This keeps them white until they can be sulphured, when the white color is permanent). Next, the rings or slices are placed on trays made of hessian or scrim, or wooden laths, put into the sulphur box or room, left for ten minutes, and then evaporated in the machine or dried in the sun.

Evaporating by machine is by far the best because the fruit is dried in a few hours, it is free from dust, the drying can be regulated all the time, and the fruit can be removed at once to an insect-proof room to cool, to be sweated, and to be packed, free from the attacks of moths, beetles, etc., which get at the sun-dried fruit.

It is very important to have the fruit all of one size, and of equal ripeness, on each of the trays, because otherwise some will be dried too much and the rest not sufficiently dried.

Sweating is done to make the whole lot evenly moist and soft; some would otherwise be a little too dry, and some not dry enough; so the dried fruit is put into a heap and covered with bags. The process may occupy only a few hours, or it may take a few days. Examination will show when the fruit is fit to box up.

Peaches and pears are usually peeled, and the pits are removed from the peaches, which are also halved, whilst the pears are quartered. Both are generally sulphured, to bleach the fruit, but the flavour is certainly not improved in any fruit by sulphuring.

Apricots should be very nearly but not quite ripe for drying purposes. They are split, stoned, and bleached by sulphur, which is not necessary, but makes the product bright and attractive.

Nectarines are treated in the same way as peaches, and quinces are treated like apples.

Figs should be dead ripe, then placed on trays exposed to sun heat, turned, and packed tight in boxes when no moisture can be squeezed out.

Grapes are dried on wood trays, exposed to sun, and turned over every day. When no moisture can be pressed out the raisins are fit to box up.

PROFITABLE FRUIT DRYING.

The Goulbourn Valley is noted throughout the Commonwealth for the excellence of its stone fruits. In apricots especially the locality is said to be unexcelled. The following article by "Penang" of the Australasian descriptive of one of the most extensive orchards is interesting.

For many years the property known as Blacker's orchard has continued to produce large quantities of dried apricots, peaches, and plums, and no difficulty has been found in securing a good market. The orchard, including about 22 acres of vines, amounts to 105 acres, and of this area 32 acres are planted with apricots, 11 with peaches, and a small plot is utilised for growing plums. Mr. Hart, who is in charge of the property, is a capable manager. Not only does he undertake the care of the orchard, but he also supervises the whole of the work connected with the drying and preserving operations. Large quantities of fresh

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fruit are marketed and exported, though as far as the stone varieties are concerned, their destination is governed by the quotations ruling the market. While the prices for fruit remain firm, such portions of the crop as are sufficiently ripe are sent to Melbourne, and as the season advances and fruit from other parts commences to arrive and exert a lowering tendency on prices, recourse is had to drying.

— Curing the Apricot. —

An idea of the magnitude of the operations conducted at this orchard may best be formed from the fact that at a single time 2,000 trays of apricots and peaches have been spread in the drying paddock during last season. The produce from approximately 8,200 apricot trees is a vast amount to deal with during the limited period over which the fruit ripens. During this time as many pickers are employed as will keep the cutters busy dividing the fruit and extracting the pits. The fruit is then placed on trays in readiness for treatment in the sulphur chambers prior to being dried in the field. An ingenious arrangement has been devised on this property for sulphuring the fruit, which is a distinct improvement over the ordinary box. Instead of the chamber being fixed against removal and fitted with a door through which to carry the trays and arrange them in position in the box, a portable one, without either bottom or door, is employed. Holes have been dug in the ground, into which receptacles for holding the sulphur are placed, and at the surface level, oven doors have been fitted to guard against accident when the sulphur chambers are not in use. So soon as a sufficient number of trays have been prepared for sulphuring, the fumigant is placed in the pot and ignited. Trays to the number of from 45 to 50 are then stacked over the hole, the door of which is left open, the covering or chamber to prevent the escape of the fumes being then lifted bodily and placed over the fruit. In the ordinary sulphur box there is scarcely room in which to turn and arrange the trays, and a similar difficulty is encountered when the fruit is removed. By the use of the ground ovens all this is avoided. Usually apricots are allowed to remain in the sulphur box for about six hours, though in other places a shorter period is considered sufficient. In Mr. Hart's opinion the fruit is benefited by the longer treatment. "Fruit," he says, "may take as good a colour when left in the sulphur box for four hours, as it will when left for six hours, but the question is whether it will keep as well." Dried fruit at any time may be expected to be held for twelve months before it is consumed, and, unless it is thoroughly well sulphured, it is likely to deteriorate, and lose its bright, attractive appearance. After passing from the sulphur boxes the trays are spread over a lucerne field to allow the fruit to dry. This generally occupies three days for such varieties as the Moor Park, Oullins, Hemskirke Royal, and Dundonald.

— Treating Other Fruits. —

In addition to the apricots, large quantities of peaches and plums receive treatment. The varieties of peaches most suitable for drying in this district are the Pullar's Cling, Crawford, Salway, and Briggs's May. Under the system of cultivation they appear to have more body and substance than do other kinds, and when dried they weigh more heavily. The treatment is the same as with the apricot, but a little extra time is required for drying. Usually they take a day longer to cure, but with both fruits the period is apt to vary according to the strength of the sun. The best indication that the flesh is well dried is the state of the cups or hollows left by the removal of pits. When these commence to moisten with the juice after the other parts have dried, it may be taken as an indication that the trays are just ready for stacking prior to their removal to the packing house. Plums are subjected to different treatment. The fruit is placed in wire baskets or zinc colanders, and immersed in a vat of caustic lye, of much the same strength as is used for dipping sultanas—about 1lb. of caustic soda to eight gallons of water—for a period of thirty seconds. The object of dipping in lye is to slightly crack the skins, so as to enable the juice to be drawn out by the heat of the sun when the trays are placed out on the drying ground. Plums take considerably longer than other fruits to dry out, from six to ten days being necessary to thoroughly cure them. Last season, when the fruit of the Angelina variety was being sold in the market at from 2/- to 2/6 a case, the crop was treated in this way, and it is estimated that the fruit will now realise about 6d. a pound in the dried state. Such a position enables one to be entirely independent of the market, drying operations acting as an insurance against unprofitable seasons. In addition to an extensive drying ground, the orchard is equipped with a modern evaporator to guard against unpropitious weather conditions. The temperature of the room is maintained at any heat desirable, generally between 150 and 180 degrees when fruit is being dried, by means of steam pipes and ventilators worked by and 8-h.p. steam engine in combination with a Jackass boiler.

— Simple Contrivances. —

Not the least interesting among the labour-saving devices planned by the present manager of the establishment are simple arrangements for facilitating the grading of the dried fruits, and a pressure gauge fitted to the spraying outfit. Both are simple, cheap, and wonderfully effective. It is customary to divide the dried fruits up into four grades, and for this purpose as the produce is taken from the trays it is emptied on to a table about 6ft. by 4ft. in measurement. On either side of the table, about 2ft. apart, pieces of the surface nearly 6in. square have been sawn out, and into these have been inserted, in a sloping position with the openings towards the centre of the table, oblong wooden shoots slightly raised above the level of the table and leading down towards the floor. When grading commences, the operators, after placing boxes on the floor beneath the openings of the shoots, take their positions at the table and merely throw the different sized fruits into the openings corresponding to the various grades being packed. In lieu of the expensive mechanical graders in use, it would be harder to find a cheaper device more suited to the hand-grading requirements of a small drying establishment. The pressure gauge fitted to the spray pump is of particular interest to all fruit growers, for at a small outlay of about 30/- it can be attached to most types of spraying outfits. Its instalment affords a sure guide to the power with which the spraying mixtures are applied to the trees. The plug at the top of the ordinary air chamber is unscrewed, and in its place is fastened a pressure gauge capable of registering up to 200lb. power. As the lever of the pump is moved up and down, the indicator hand on the dial moves in accordance with the pressure generated in the air chamber, thus making it possible for the pump operator to tell at a glance the exact force with which the spray is applied.

The Nomenclature of Fruit.

In the closing paragraphs of an article on the above subject reprinted last month from the Victorian Journal of Agriculture, the writer, Mr. H. H. Prescott referred to the confusion entailed by the present system or lack of system in the naming of fruits. He continues as follows :—

To further instance how confusion in names and varieties may occur, it is interesting to recall the introduction of the apple Jonathan into Victoria. This popular apple, which was raised in the New York State, was ordered from America by the Royal Horticultural Society of Victoria some forty years ago. On the tree fruiting at the Burnley orchards, it proved to be Esopus Spitzenburgh ; at the same time, the tree imported as Marston's Red Winter was found to be wrongly named—it was really Jonathan. This caused much confusion, until fresh importations of Jonathan trees showed it to be the same tree that was previously imported as Marston's Red Winter. In America, Jonathan is variously named King Philip and Philip Rock, in honour of the man on whose farm the original trees grew.

Wickson also refers to this question in his remarks on the introduction of the prune d'Agen into California. In 1856, scions of the French prune were introduced into California from Agen in France by some French settlers. The growers were disappointed that the resultant prunes were smaller than the commercial French prunes. Because of their smallness, these growers named these prunes the Petite Prune d'Agen. Trees of a larger supposed prune were imported and sold as Gros Prune d'Agen, adding a German word to the French name. When shown that if it were a true French prune, the French would have used the French word "grande," and not the German word "gros," the importers said that the prune was really German, and was known as the Hungarian prune. And, as a matter of fact, the new prune happened to be neither French, German, nor Hungarian, but the old English plum, Pond's Seedling. Still, this did not suffice, and a Californian grower visiting France made a special study of the question, with the result that the original variety proved to be the prune d'Agen. In their further search for a larger prune, the Robe de Sergeant was introduced. This again led to confusion ; as while Robe de Sergeant was a synonym of prune d'Agen, this newly introduced fruit was different again from d'Agen. In this case, it was ultimately found that d'Agen runs larger in various districts and soils, and that in the last case, it was the larger variety that was introduced.

Thus, Prune d'Agen, Petite Prune d'Agen, Gros Prune d'Agen, Hungarian Prune, French Prune, Pond's Seedling. and Robe de Sergeant—seven names, all supposed to be different fruits—really were only two separate fruits. And the confusion still exists, and requires elucidation ; for, while both Hogg and Downing give Prune d'Agen and Robe de Sergeant as synonyms, Wickson illustrates them as two different fruits. Then, in Victoria, it is possible to buy trees of Angelina Burdett and Prune d'Agen, and, when they yield, the fruit is absolutely identical.

There is growing in an orchard in the Eltham district a remarkably fine late dessert apple, quite distinct from anything else we have. The apple is well worthy of cultivation for its superior qualities. Local growers name it "Ford's." On inquiry, i was found that the apple was s named owing to the fact that th original tree was growing in a garde which was owned many years ago b a Mr. Ford, who is supposed to hav planted it there. Mr. Ford was communicated with, and he stated tha the late Mr. Charles Draper had imported the tree from America man years previously, and, as a speci favour, had given him two graft which he worked on an old tree. H never knew its name. At presen it is impossible to trace this appl So far as can be ascertained, it i not in the Burnley collection ; bu when the apple is recognized, and it proper location found in pomology, i will still be known to the old grower as "Ford's," while by the newe growers it will be given its correc name.

— Similarity of Names. —

It is still a subject for wonder f the uninitiated that River's Earl Peach, Early Strawberry, Blenhei Orange, and Liveland Raspberry ar apples ; that Peach is a pear ; tha Peach and Royal Orange are apricots that Sultana is an almond as we as a grape, and so on.

We have Norfolk Beauty, Norfol Bearer, Norfolk Beefing, Norfolk Col man, Norfolk Paradise, Norfolk Ston Pippin, and Norfolk Storing ; and w also have Beurres, Bon Chretiens Doyennes, and Reinettes in abundance There is a Mr. Gladstone peach raise by Rivers, of England, and a M Gladstone peach raised by the lat Mr. Haley, of Diamond Creek, Victoria. There is a May Duke cherr and gooseberry ; a Prince of Wale peach and plum ; a Climax apple an Japanese plum ; a President strawberry and plum ; a Sultan Japanes and a Sultan English plum.

Then, there is the name "Dunn' Seedling." Quite a number of apple are locally given this name ; bot Munroe's Favourite and Schroeder' Apfel are in different localities give it, while Schroeder's Apfel is sometimes called Munroe's Favourite. Th two apples are entirely distinct Munroe's Favourite, again, is ofte called Garibaldi—which it is not Garibaldi is another apple. In Ne Zealand, Munroe's Favourite is know as Ohinemuri — while elsewhere it i variously known as Gander's Seedlin Golden Cup, etc.

Then there is the well known appl previously referred to, called Cleopatra, or New York Pippin. Wher these names came from is not known This apple it certainly Ortley, whic is so largely grown in America Ortley enjoys twenty - two othe synonyms in America and two mor in England ; and adding its correc name, together with our two Australian ones, this popular America apple carries no less than twenty-seve names. No wonder it is popular.

Again, New York Pippin in Americ is identical with Ben Davis ; while Be Davis has for another synonym Kentucky Red Streak, which is not th Kentucky Red Streak grown her The apple known as Scarlet Pearmai

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in Tasmania is the Scarlet Nonpariel in Victoria, while American and English authorities quote these names as two separate varieties. The London Pippin is more often called the Five Crown Pippin, erroneously so according to correct nomenclature; although the latter more correctly describes its appearance, and would be a more suitable name.

Thus, even with apple names, we might well pause and ask where we are. Enough has been said on this subject to show how great a muddle exists. One cannot be too emphatic in condemning such nomenclature, and these anomalies should never have been perpetuated; they would not have been perpetuated had a permanent nomenclature committee been in existence in each country.

In some of the instances mentioned above, it will frequently be impossible for purchasers to obtain, and certainly impossible to define, the variety they desire. Thus the loss to the grower, who waits years for his trees to fruit, and then finds that he has a variety not wanted, and so either has to grow an unsuitable fruit or replant his land, is incalculable.

— Long Names. —

Still another fault is the great length of names sometimes given to fruits. Frequently it may be taken, although not always, that a big name is synonymous with inferiority. And so we have Borsdorffer Strie de Boheme apple; King of Tomkin's County Pippin apple; Twenty-fifth Anniversarie de Leopold I. pear; Citron-berne Bomische grosse punitirte pear; Grosse Weiss und Rothgestriefte Johannesbeere currant; Mirabelle von Flotow's gelbe fruhbe quetsche plum; etc.

— Synonyms. —

There has thus crept into commercial life such a cumulation of names that it is a wonder that people know which fruit to order. Some of our popular and well known varieties of fruits carry a great number and diversity of names. For example, in apples, the old Buckingham is known under 24 names; Fallawater, an American favourite, owns 18 names. Ortley admits no less than 27, while Nickajack is the possessor of 38. In pears, the same multiplications exists, thus Beurre Diel has 24 names; Flemish Beauty 29; Uvedale's St. Germain 36; (and this must not be confounded with the variety St. Germains, which is a different pear, and has itself 14 names). The list is topped by White Doyenne, or Doyenne Blanc, which answers to no less than 39 synonyms.

— The Remedy. —

The remedy will only be achieved by unanimity of action between officials, fruit-growers, and nurserymen. The adoption of a standard list is the first necessity, and for the older varieties we have such authorities as Hogg, Downing, and Thomas; later we have Wickson, and the reports of the Royal Horticultural Society of England. But none of these authorities deal directly with Australian fruits.

Co-operative action, in the direction of a Pomological Committee, is the only remedy; and nurserymen should agree to sell no variety, fruit-growers to grow no variety, and officials to recognize no variety, that has not received the acceptance of such an association.

The Pomological Association of America has seven rules only, and these are subjoined to show the mode of action, which is reputed to be eminently satisfactory.

-- Rules Adopted by the American Pomological Association for Naming and Describing Fruits. —

1. The originator or introducer (in the order named) has the prior right to bestow a name upon a new or unnamed fruit.

2. The society reserves the right, in case of long, inappropriate, or otherwise objectionable names, to shorten, modify, or wholly change the same when they shall occur in its discussions or reports; and also to recommend such changes for general adoption.

3. The name of a fruit should preferably express, as far as practicable by a single word, a characteristic of the variety, the name of the originator, or the place of its origin. Under no ordinary circumstances should more than a single word be employed.

4. Should the question of priority arise between different names for the same variety of fruit, other circumstances being equal, the name first publicly bestowed will be given precedence.

5. To entitle a new fruit to the award or commendation of the society, it must possess (at least for the locality for which it is recommended) some valuable or desirable quality or combination of qualities in a higher degree than any previously known variety of its class and season.

6. A variety of fruit having been once exhibited, examined, and reported upon, as a new fruit, by a committee of the society, will not thereafter be recognized as such so far as subsequent reports are concerned.

A rule governing the revision of names was authorized by the Association at its meeting in Washington in September, 1891, as follows:—

Prefixes, suffixes, apostrophic terminations, and secondary words, together with words whose significations are expressed in the descriptive columns of the catalogue, are eliminated from the names of fruits, save in a few cases in which they may be needful to insure the identity of a variety and in a few time-honoured names.

The anglicizing of foreign names is resorted to only in the interest of brevity or pronouncability.

In questionable cases, subsidiary words are retained in parentheses.

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Cut Worms

By C. French, Jun., Victorian Journal of Agriculture.

During the past season numerous inquiries for information in regard to the above mentioned insects and the best means for destroying the same have been received. The Climbing Cut Worm (Mamesta evingi) has been very prevalent, grain crops, barley in particular, being badly attacked. Other Cut Worms—Agrotis (several species), Heliothis, Armigera, Leucania, and others—have also been much in evidence. Cut Worms are amongst the most troublesome insects growers have to deal with, and every year they are the cause of much destruction on farms, vineyards, and gardens. Wheat, oats, barley, maize, vines, plums, tomatoes, onions, beans, cabbages, and potatoes are all subject to attack.

Cut Worms are also known as Cut Worm Caterpillars, Looper Caterpillars, Army Worms, Take-all Grubs, etc. They are variable in colour, especially the larvae of the Tomato Moth. The latter vary from green to yellowish, but most of the Agrotis are of a dirty greyish or light-brown colour, without hairs or spines, smooth, and greasy looking, often being of a similar colour to the ground in which they hibernate. Some of the cut worms feed both day and night, whilst others hibernate just under the soil, or under logs, stones, bags, bark, and rubbish during the day and feed during the night. When they are fully grown (which takes a couple of weeks), and until they are ready to pupate, the pupa is of a dirty reddish-brown colour, sometimes almost black. After pupating, they remain in the ground, in the warm weather, from ten to fifteen days before the moths emerge; in the cold weather, the period is much longer.

— Life History. —

There are at least two broods of cut worm moths in a season, but further observation will be necessary before the number is finally ascertained. The moths usually fly about at dusk and deposit their eggs on any suitable plant. The eggs hatch in a few days, and the young cut worms start to feed at once, any kind of green food being speedily eaten by them. Even when the grain is just sprouting it is attacked, and often they will eat right into the husk.

— Remedies. —

By the eradication of weeds and the burning of haulms and stems of harvested crops the cut worm evil may be greatly minimised, as by this means many eggs are destroyed.

Growing crops may be treated in the following manner:—Place between rows of an infested crop or at short distances apart, bundles of any succulent weed or vegetable which has been previously poisoned by dipping it, after tying in bundles, into a strong mixture of Paris green 1 oz. to a bucket of water. The cut worms eat the poisoned plants, bury themselves, and die. In hot, dry weather the bundles should be put out after sundown. Correspondents have frequently inquired whether there is any likelihood of vegetables absorbing Paris green from the mash when placed near the roots. I am assured by the Chemist for Agriculture that there is no danger as the Paris green is practically insoluble, and therefore cannot be absorbed by the various plants.

The poisoned bran mash has also been successfully tried. The best proportion to use is one part by weight of arsenic, one of sugar, and six of bran, to which is added sufficient water to make a wet mash. This mixture is usually made in a wash tub or half barrel. One of these is filled three-fourths full with dry bran, and to this is added about 5lbs. of arsenic, which is thoroughly stirred through the bran with a spade or shovel; 5lbs. of sugar are next thrown into a pail, which is then filled with water, and the sugar stirred until it is dissolved, when the sugar water is added to the bran and arsenic, and the three well stirred. More water is added and the stirring continued until every portion of the mash becomes thoroughly saturated. The mixture should be placed round and through the crop, or at the foot of the tree, plant, or shrub infested, dropping it into the shade when this can be done. Both of these preparations should be kept out of the way of children and domestic animals.

With regard to the efficacy of the poisoned bran mash, I have recently received the following letter from Mr. G. Ray, of Lindenow, Gippsland:—

The cut worms were very prevalent this season, but I have had great success in destroying them.

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TRY HARDY'S FAMOUS WINES

I had a crop of English barley, and, thanks to the use of the bran mash, I have just threshed from 40 to 70 bushels per acre. The caterpillars were two or more inches deep in shady places, and I am sure that I would not have had any returns unless precautions had been taken.

Mr. C. W. Malley, Eastern Province Entomologist in South Africa, reports excellent results with poisoned baits. He says:—

It occurred to me that by cutting up any available green stuff (lucerne, barley, maize, cabbage, rape, young succulent weeds, etc) into small bits, say half an inch in length, it could be moistened with the poisoned sweet and then scattered broadcast over the lands with least labour and material. In this way, it is distributed evenly, and at such frequent intervals, that the cut worms are practically certain to find it before they do the plants. Their fondness for sweets induces them to fully engorge themselves on the bait, a fact which makes their destruction certain. There is also no danger to stock, for the pieces of bait are so small that nothing but poultry can pick them up, and it is not likely that even they will get enough to injure them. But, as a precaution, they should be kept from the lands where bait has been spread.

During the past six months several additional experimental tests have been made for cut worms, and with satisfactory results. I see no special difficulty in the way of its application on a large scale to lands planted with tobacco, maize, or other crops, and therefore call attention to it for the benefit of any who may have occasion to use it.

— Method of Preparation. —

Arsenite of soda, 1lb.; treacle, or brown sugar, 8lbs.; water, 10 gallons.

Dissolve the arsenite of soda and the treacle in the water. In the meantime, cut up the lucerne, or other green stuff, into small bits, and then moisten it with the poisoned sweet. Be careful not to make it too wet or it will not scatter well when broadcasting. For the best results, the bait should be distributed a few days after the ground has been ploughed, and all green, succulent vegetation destroyed. The cut worms that are not crushed in ploughing will then be on the surface again, and on account of their long fast, practically all of them will be prowling around in search of food. In this way, one application will probably be sufficient. If injury is noticed after the young maize plants appear, the application should be repeated."

Arsenate of lead spray has proved one of the best remedies yet discovered. Where cut worms are feeding in grass paddocks adjoining crops, it is advisable to spray a strip of the crop. After devouring the grass, they move on to the crop, and when they come to the sprayed portion devour it greedily, and are soon destroyed. If vegetables are sprayed it is advisable to thoroughly wash them before using.

The trench system is a simple and effective method of eradication. A trench or furrow should be either ploughed or dug around the crop towards which the cut worms are feeding. It must have clean cut sides; those nearest the crop should be undercut so as to prevent the cut worms from crawling out of the trench. Deep holes should be made in the trench at intervals of, say, five yards. When travelling towards the crop the cut worms fall into and crawl along the trench and ultimately into the holes. A few shovelfuls of earth, well rammed, will then speedily destroy them. Should the pest be already in the crop it will be necessary to run a few furrows through it.

Another plan that answers well is to place a flock of sheep in the infested paddock adjoining the crop. The constant walking about of the sheep will destroy the cut worms.

If cut worms are prevalent in gardens, rake the ground up close to the plants. By this means many of them are turned up; and, if poultry are allowed to run over the ground very few will escape their notice. They are also easily injured by the rake and are then likely to be eaten by ants and insectivorous birds when exposed on the surface of the ground.

Numbers of cut worms are destroyed by hymenopterous and other parasites. Very wet and cold weather also keeps them in check.

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Among contractions used in certain postal districts are "aux," and "ass.," meaning respectively auxiliary and assistant postmen. A branch postmaster, in preparing his periodical report for the head office, wrote as follows:—"Dear Sir.—I beg to report that the ox has returned and the ass has now gone on leave."

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CURRIE STREET.

Plants for the Salad.

Burnet is a hardy perennial, commonly propagated by seeds, which should be sown in the spring. A somewhat poor soil and a dry situation suits it best. The plants should stand about eight inches apart, and if they are not allowed to seed, will last many years. When the leaves are young and tender they have a warm taste, with a strong cucumber-like odour. When fully developed the leaves are nearly two feet in length, and may be employed instead of the indigestible cucumber in making a mixed salad. Burnet is a very old English plant, and was formerly thought to possess great virtues. It has been called the friend of the heart, liver, and other principal parts of the body. A few stalks of it placed in a cup of wine were said to give a fine relish to the liquor, quickening the spirits, refreshing the heart, making it merry, and driving away melancholy.

Corn Salad is an annual plant, very hardy, and of earlier growth than most plants. The leaves may be boiled, and eaten as spinach; they have no remarkable flavour to recommend them; but they are useful in making a mixed salad.

Rampion is a hardy biennial plant, belonging to the Campanula family. It has pale blue flowers, and attains a height of about two feet. The whole plant abounds in a milky juice. The roots are long, and white, and may be eaten raw, like radishes; they have a pleasant, nutty flavour, and are sometimes boiled and eaten like parsnips; they may be taken up and stored in dry earth until wanted. Both roots and leaves are used in salads. The rampion is sometimes found in the flower garden, cultivated as an ornamental plant.

The sorrels are largely used in France for using in soups and also in mixed salads. There are several varieties, which are propagated by seeds and by division of the roots. The leaves of sorrel are used in France as spinach. They are said to greatly promote digestion. They give a pleasant flavour to mixed salads, and make a very good substitute for apple sauce with roast pork, goose, etc. In Paris large quantities of sorrel are used in soups, sauces, and stews. The plant is increased by seeds and by division, and it will grow in almost any kind of soil, and with little attention.

Endive should be more commonly grown by Australian gardeners, than it is. In France, Belgium, and other European countries, it is much esteemed. It may be used alone or in a mixed salad. The moss-curled and green-curled kinds are good, and the broad-leaved Batavian is fancied by many growers. The plants, like lettuces, delight in a rich soil, and they must not be crowded. To make them palatable they must be blanched; this may be done by covering the plants when large enough with inverted flower pots, or by laying light slates or tiles, or wood, over the plants; this must be done on a dry day; or the leaves may be drawn together and tied in the same manner that Cos lettuces are sometimes treated.

The lettuce is the most important plant of all salads, and by successive sowings it may be had all the year round. Rich land and a continuous supply of moisture are necessary to procure sweet and succulent lettuces. Sow thinly, and transplant while the seedlings are still small. In the summer time it is better to sow the seeds where the plants are to remain.

In parts of France large quantities of dandelion are grown, and forwarded to the Paris markets. In India the plant is used as a remedy for liver troubles. The roots are dried, ground, and mixed with an equal quantity of pure coffee, for making an agreeable beverage, which is believed to have a medicinal value. When the leaves are blanched they form an agreeable component of salads, and they are also used alone. Unless the plants are blanched, the leaves have a very bitter flavour; the exclusion of the light removes the bitterness. The plant will grow in almost any kind of soil. The blanching process is done by placing an inverted garden pot over the plant, or by spreading clean, sharp sand four inches deep over the whole of the bed.

Chicory, by successional sowings, may be had as a salad all the year round, but it is better adapted for winter use than for summer. A deep, rich, sandy loam suits it best, but like most other root crops it does not like fresh manure. The leaves may be cut and used all through the summer and autumn; they are a trifle bitter, but very wholesome. The plant is best when blanched. This is done in various ways. Sometimes the roots are lifted, tied in bundles, and then placed in a hot-bed or forcing-house. The roots are also treated in a similar way to that adopted for sea-kale. The seed should be sown in drills a foot part, and the plants thinned out to 6in. or 9in. In dry weather plenty of water should be given, and liquid manure occasionally. Witloof or Brussels chicory is a distinct kind from the common sort, and is the one most largely cultivated for salad purposes.

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Mrs. Johnson had gone from home, leaving Mr. Johnson disconsolate. On arriving at her destination she missed her gold lace pin, and wrote her servant, asking the girl to let her know if she had found anything on the dining room floor. The servant wrote as follows:—"When sweeping the dining room floor this morning, I found thirty matches, four corks, and a pack of cards."

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— Internal Bleeding. —

When haemorrhage from an internal organ is suspected, the golden rule is to keep the animal as quiet as possible, and to this end a stiff dose of opium or other sedative medicine is advantageous. In such cases, opium has the added merit that it may act as a styptic or astringent, and so assist in stopping the bleeding. Another medicine which has a powerful effect in arresting internal haemorrhage is ergot of rye, which may be given by the mouth or injected under the skin or into the blood stream in the form of liquid extract of ergot, the dose of which for a horse or cow is from half an ounce to an ounce. most marked sign of internal haemorrhage is a sudden paleness of the visible mucous membrane.

— External Bleeding. —

Except it is excessive to a degree likely to become exhausting, external bleeding is not such an alarming affair as is usually thought. Unless the bleeding vessel is a comparatively large artery, it is surprising how quickly it will close if the animal is kept still. Much apprehension need not be felt unless the blood is spurting in jets. The bleeding from an operation wound is usually much more serious than that from an accidental wound, because in the latter case the vessel is usually torn asunder, while in the former the cut is usually a clean one, and there is no tendency for the vessel to become plugged by the tiny shreds of torn tissue round which clotting occurs so quickly.

In the case of a large vessel being cut during an operation, the safest plan is to secure the bleeding end with a pair of forceps, and either apply a silk ligature, or twist the vessel until the end is almost torn off. Failing this, the wound would be sluiced with a solution of perchloride of iron, plugged with cotton wool or antiseptic tow, and stiched up. The object of this procedure is to get a quick clotting of the blood, by which the cut vessel ultimately becomes plugged. The application of cold water or ice to the part, by producing contraction of the blood vessels supplying it, is also helpful. Cold water continuously played on the loins is particularly useful in bleeding from the cord after castration, or from the womb after calving or foaling. In the latter cases, the flooding of the womb with cold water, or even the insertion of a chunk of ice, may have to be resorted to.

When the bleeding is from one of the large vessels of the limbs, the application of pressure above the seat of bleeding by means of a tourniquet or tight bandage is very effective. If pressure is applied directly to the main vessel of supply, by means of a cork, plug of grass, or some such substance, held in position with the bandage, the bleeding will cease almost directly; but an exact knowledge of the vascular anatomy of the part is necessary to effectively accomplish this.

To avoid excessive bleeding while operating on the limbs, it is always advisable to apply a bandage or tourniquet to the limb above the seat of operation. For operations in other parts, the prior injection of adrenalin has recently been practised extensively to produce a transient bloodlessness, but its use in those cases which have come under the author's observation has not been so completely successful as was expected.—By S. S. Cameron, M.R.C.V.S., in the "Victorian Journal of Agriculture."

◆

Turning Out to Grass.

Opinions always have differed, and presumably always will differ, regarding the advantage gained by a horse through being turned out to grass in the summer. In this connection, as in many others, circumstances alter cases, and consequently a course of management which may suit one animal may be wholly inapplicable to another. It is pretty certain, however, that unless a fairly long spell of rest can be given a horse, it is a mistake to turn him out, as in such a case his system becomes disorganised without an opportunity for recovery being provided. It is, as a general rule, better therefore to grant a working horse a spell of liberty in a spacious box, especially if there is a straw yard attached thereto, than to turn him out amongst a lot of strange animals. Should the latter alternative be adopted, it is desirable that the hind shoes should be removed as a precaution against injury to other horses; in fact, many owners of grazing land will accept horses at grass upon no other terms. Removing the front shoes is not to be recommended under ordinary conditions, as the hoof is liable to become broken away; but should the horse be left out for any length of time it will become necessary to have him up and remove the shoes about every three or four weeks, lest they should become tight, owing to the growth of the horn. When the horse is brought in from grass it is a great mistake to treat him forthwith as though he had been in his stable and at work all the time his holiday had lasted. A dose or two of cooling medicine should be given to him; he should not be put to hard work at once; and his return to the conventional diet of wheaten hay, and chaff should be effected gradually. The equine nature resents all violent and sudden changes of diet, and therefore no greater mistake can be made than to take a horse up from grass one day and put him on dry food the next one. Either Epsom salts or aloes are usual medicines at such a time; the former, being the pleasanter to use, as 4oz. for a full-grown horse once a day in his food is easy to give; whilst aloes have to be administered as a medicine in doses of about six drachms, more or less, according to the size and strength of the animal.—Exchange.

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Feeding the Pig.

From Queensland Agricultural Journal.

What is a complete food for the pig, and will it pay to feed some wheat even when wheat is pretty high in price? If wheat is fed with maize-meal, the results are highly satisfactory. Bran, because of its character and composition, is not a wholly desirable feed for pigs. Middlings may be fed with profit at any time during the hog's life. They are not only rich in protein and ash, but are what may be called a clean, smooth food, being free from objectionable crude fibre which so prominently distinguishes bran. Barley is an excellent food, and properly handled will produce some of the best pork in the world. Barley and peas will make pork production profitable, if given the opportunity. Peas, as all understand, are a highly nitrogenous food, and when dry should always be fed with some other grain.

There are some who do not appreciate the value of lucerne hay for swine. It is to be regretted that such appreciation is not universal. It is not only valuable because of its high merit as a feed, but because of the bulk it furnishes. No growing animal should be fed exclusively upon the grains. Swine will eat dry lucerne hay with a relish, but the better way to feed it is to cut it up, steam it or pour hot water on it, and mix with meal. Pasture, if it is the right kind of pasture, is nearly an essential in profitable swine raising.

— Feeding the Brood Sow. —

In the paper on this subject in the Live Stock Journal taken from an American source, advice is tendered which my own past experiennce would make me very careful not to take. In the first place, mangels are recommended to feed the in-pig sow on, while I have known numerous cases where these roots, excellent food as they may be at other times, have acted in the most deleterious manner upon the unborn litter, which, though born alive, have all died within an hour or two after birth, and this has occurred both in my own herd and in that of others I have known. Then there is the recommendation to supply the young pigs at a fortnight old with new milk so as to assist their mother to rear them. Now, a cow's new milk with just a small portion of sugar and a drop or two of oil—cod liver for choice—will rear a young pig deprived of its dam, and often the pigs so fed grow faster than those left to the care of the sow, but a mixture of food composed of two kinds of milk is always bad. In pigs, when very young, it is almost invariably followed by acute diarrhoea, and it is a well-known fact that, however, well either pigs or children will do upon cow's milk alone when judiciously given, they never thrive so well when it is given as an adjunct to their mother's milk. A little corn, such as crushed oats, and, later, crushed Indian corn, is the best food for young sucking pigs till they begin to eat with their dam, when, if her food is of a milky nature, they may take it without harm. The advantages of letting sows, especially Berkshire and kindred breeds, run out to grass, is well worth remembering as an excellent practice.

— Feed on Right Lines. —

It is not enough to breed well. Feeding is as important as breeding. No matter how good the stock may be, if the young sows are not fed all they want to eat from birth until farrowing time, they will be poor milkers. It is impossible to develop a roomy sow with milking capacity without feeding largely on albuminous foods. The proper frame, bone, and form can be developed on good pasture combined with foods in which oats, bran, and milk are predominant, with plenty of exercise for muscular development, and they can be obtained in their highest form in no other way. The short, compact brood sow, pretty as a picture, is not the one to yield a profit in the breeding herd.
Plenty of rich food will develop b
beauty, because it will develop b
fat; but fat and a high degree
fruitfulness or fecundity are incor
patible.

All through the summer the pi
can be fed slops to good advantag
but it should be kept clean a
sweet.

Food must be selected for speci
results. No breed can convert fatte
ing food into juicy, lean meat.
animal when fed an excess of fa
formers can change part of those in
bone-builders and muscle-makers.
not stint the feed of your breedi
herd to avoid fat, but choose su
foods as are rich in flesh-forme
bone, muscle and nerve materials, a
use sparingly starchy foods, such
have a tendency to produce too mu
fat. There is a great differen
between flesh and fat.

The Farmer's Gazette publishes t
following notes on feeding pigs:—Pi
should be well but not overfed.
good bacon pig of 12 stone ought
be produced in seven months from
birth. It should not be cramme
neither should it be half-starved, b
fed steadily and regularly. Pigs f
steadily and regularly will give t
most satisfactory results to the fee
when weighed in the factories.
hog which has been half-starved
any period of his life, even thou
well fed afterwards, will not do
Feed three times a day at fix
hours; never leave food in the troug
after the pigs have finished. The fle
of hogs is soft and flabby if fed
brewery or distillery stuff, or
turnips or mangles, and in compa
son to their size their weight in
scale is miserable. They may dece
(we doubt it) the buyer who buys
"guess," but they will not deceive t
scale-weight.

The best classes of food for p
feeding are:—Potatoes (cooked), mi
barley-meal, oatmeal, crushed oa
pollard, bran, ground wheat, ryeme
Indian corn. The latter should
only used sparingly and in conju
tion with other foods, such as p
lard, bran, or milk; and shou
always be ground as fine as the m
can make it, and thoroughly cook
otherwise the Indian corn pas
through the animal undigested, a
to the loss of the feeder. Barley-m
need not necessarily be cooked—sca
ing it will do. It is certainly
best food, except perhaps potato
for producing pork. Never sell bar
of moderate quality to buy Indi
meal. Grind your barley, feed it
your hogs and their weight when d
will astonish you.

The secret of making money by p
is not to rush into them, nor out
them. Never keep too many; ne
keep too few. The fault in the p
has been that feeders ran in to h
when hogs were dear, and stayed
home when they were cheap.

You will not get well-shaped p
from a badly shaped boar; neit
will you get thrifty pigs from
unthrifty sow. If you do not k
your pigs clean and dry, they

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not pay you. A pig, any more than a human being, will not thrive on a foul, damp bed. The best thriving pigs we have ever seen were those produced from an ordinary well-shaped country sow and a thoroughbred Yorkshire boar. The services of this latter class of animal can easily be had now-a-days. A long-legged, ungainly boar will get a leggy, flat-ribbed, cat-hammed, herring-gutted, miserable class of pig, which will pay nobody, and deceive nobody as to their quality, except perhaps the man who feeds them. The tall, leggy hog was ignorantly thought to deceive the buyer who purchases by "guess," but does not deceive the factory weigh-master.

No matter how low prices may be, if it does not pay to feed pigs it certainly does not pay to starve them. If you cannot afford to keep a breeding sow yourself, get two or three of your neighbours to join you, and divide the expense and the progeny. A good sow is easily fed, and is the best savings bank you can have. The day you buy is the day you sell. If you pay too much for the store you will want (but will not get) too much for the bacon pig. Where a proper sow is kept, young pigs can be produced for 1/- a week of their age—that is to say, eight weeks, 8/-; ten weeks, 10/-; and so on, up to twelve weeks. Why should the feeder pay practically double this? One great secret of pig-raising is: When the pigs are high in price, do not lose your head and throw your money away; when pigs are low, do not lose your head and throw your pigs away.

— Weaning Pigs. —

A common practice has been to allow the pigs to suckle until they are six weeks old. Then they are suddenly weaned, and one or two pigs are left to keep the sow's udder from inflammation. That course has a tendency to stunt the pigs which are taken away, and when a pig is once stunted in its growth it hardly ever recovers what it lost. A pig should be left to suck not less than eight weeks. They should have learned to eat with the mother. By throwing a handful of oats on a clean place on the floor, when the pigs are three weeks old, they will begin to pick them up. Then there should be a low and shallow trough from which they can obtain skim milk mixed with pollard or mixed with a small quantity of ground grain. If the young pigs can be turned out with their mother on pasture before they are weaned, they will learn to eat it rapidly. They should be given a chance to take plenty of exercise. From the time the pigs are weaned a moderate supply of skim milk, buttermilk, green lucerne, or similar feed will promote the growth of lean flesh.

Want of exercise and want of flesh-producing food during that period of their growth will prevent any breed of hogs from developing the flesh qualities which are wanted in the bacon and hams. It is improbable that any kind of feed during the fattening of the animals can result in producing a large proportion of lean flesh unless the animals are well and regularly fed when young.

The following opinion on weaning pigs is given by Professor Henry, of Wisconsin:—Pigs are generally weaned when from seven to ten weeks old. This is best accomplished by first removing the two strongest members of the litter to a separate pen, and after two or three days taking away others, always choosing the most vigorous, until all are removed. Under this practice the milk flow of the dam will gradually diminish until it ceases. Many breeders allow pigs to wean themselves—a result reached without difficulty where they are liberally supplied with palatable nourishment at a side trough. When the pigs are weaned they should be placed in groups of not over twenty, care being taken that the members in each group are of the same size. Where large numbers of pigs of varying sizes range together, the weaker ones are at a disadvantage at the feed trough, and are liable to permanent injury from lack of feed and the rough treatment they receive.

A pregnant sow should always be provided with a suitable place for caring for her pigs when they have arrived safely, and this may be expected if the sow is in good health and comfortably housed. The feeding cannot be too good. The milk of the sow is extremely rich. It contains twice as much casein as cows' milk, and two and a-half times as much mineral matter, but not quite as much fat. It is thus exceedingly well fitted to nourish growing pigs, and this fact explains the rapid growth of the sow's litter, which in one month often increases in weight ten times. But the sow cannot make the milk without food, and the best feeding is required to push the little pigs along and to keep them in good flesh. At the same time the food of the sow should be changed frequently. A mixture of barleymeal, pollard, and skim milk may be fed twice a day, with a feed of soaked maize at noon, and between these meals a few roots will be excellent, and will increase the milk. The roots should be cut up into slices. Some breeders prefer to cook the food, but, apart from any other consideration, the system hardly answers, as the expense and labor of cooking are sufficient to more than counterbalance any extra profit that may be gained. Sour food is to be avoided; it is never wholesome, and is always fed at a loss as compared with sweet food. If milk can be obtained and fed sweet it is very valuable, but no sour food, not even milk, should be given to a brood sow. Feed the sow from a low, shallow trough, and the little pigs will soon learn to taste the food. As soon as the little pigs have learned to eat, make a little pen for them, and provide a small, shallow trough. At first, give a small quantity of rich food, such as sweet milk, with a small quantity of pollard or barleymeal. Never give so much that a large quantity will be left in the trough to sour, as sour milk is injurious to young pigs. Continue to increase the quantity as they learn to eat and require more. In a short time the pigs will have learned to eat, and will come as regularly for their food as the sow, and they will gradually become adapted to the food, drawing less and less on the sow, till by the time they are eight weeks old they can be separated from the sow, without checking the growth of the pigs in the least. The sow will also be in good health and vigour, ready for breeding again.

(Continued on page 320).

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Heredity and Disease.

If we define disease in dictionary terms as a "derangement in the structure or function of any organ," we shall find that this definition will include all the ailments and unsoundness to which domestic animals are heirs. Several subdivisions are necessary in the classification of these diseases, however. For instance, the large class of parasitic diseases of the blood, etc., must be separated from parasitic diseases of the skin; and these again must be widely divided from these unsoundnesses which come from work. The subdivision, at any rate between all classes of parasitical diseases and what we may for want of a better term call unsoundness, is important, because inheritance follows somewhat different lines in the two cases.

Wild animals are never unsound, and but seldom suffer from zymotic disease, but they are exempt from these two forms of ailment from entirely different reasons. Presumably they are immune from certain bacterial diseases because only those members of a race survive who successfully resist diseases peculiar to their environment; hence the apparent anomaly of animals immediately succumbing if they become infected with diseases peculiar to other countries than their native one. This can be best illustrated by a familiar example from the human race. Europeans are peculiarly susceptible to malaria, and the death-rate amongst those affected is very high, whereas the natives of the same parts are practically immune—a fact attributed to centuries of rigid natural selection and survival of the fittest among the latter. On the other hand, it is often unrecognized that our own race is undergoing as stringent an evolution with regard to tuberculosis as West African natives have with regard to malaria, and that the climate of our country is as fatal to the natives of the West Coast of Africa from tuberculosis as their climate is to us from malaria.

The same principle applies to animals, and we at once see how it is that the process of acclimatization is so fatal to some species. British horses and dogs never do well in semi-tropical and tropical climates, and tropical animals seldom survive long in our country —phenomena we loosely attribute to climate, but which in reality are closely connected with microbes and heredity. Evolution against disease is as important as evolution in any other direction.

It is generally supposed that the microbes of the various diseases originated in bygone days in single centres from single types, which changed their habits to become parasitical, and forthwith flourished. Presuming that this be so, and there is no reason to doubt it, judging from the analogy of other life-forms, diseases are never likely to die out as long as a suitable environment is to be found. The means of rapid communication of the present day ensure their transference to even the remotest parts of the world, and it is significant that diseases new to a country almost invariably assume an usually fatal epidemic form among the creatures they attack. Obviously this is because there has been no need or opportunity hitherto for evolution against the disease, hence the whole population is susceptible. A few of them may escape and live to lay the foundations of a race with a gradually evolving immunity to the particular disease which has attacked them.

These views suggest that we must henceforth look upon zymotic disease as an important factor in evolution. It is possible to conceive races in the far future immune to all diseases; in the meantime few of us can afford to allow the ubiquitous microbe to work havoc among our flocks and herds, even though the survivors (if any) may acquire immunity to the particular disease in question. We are bound to try and prevent outbreaks, even if by so doing we are encouraging an extra susceptible stock. Our present preventive methods are no doubt the cause of the extreme delicacy of domestic breeds compared with wild animals.

Modern research is proving that the inheritance of disease — or rather predisposition to it—follows the Mendelian principles of heredity. Some sorts of wheat are susceptible to the attacks of the fungoid growth yellow rust; others are not. When a variety which is susceptible is crossed with one that is immune, all the hybrid wheat is attacked by the mildew; but on self-fertilization such hybrids produce seed from which a percentage of the plants are immune, so that in this case rust immunity is a recessive susceptibility to the disease dominant. This experiment conclusively proves that resistance to disease is subject to the same familiar principles of heredity as every other character, and that as long as two susceptible forms are bred together disease will flourish in all their progeny. Obviously, then, selection for constitution is as important—indeed, even more important—than selection for colour, shape, or any other quality.

When we turn to so-called unsoundness, the matter is rather more complex. All species of animals alike are fitting subjects for the attacks of various bacterial diseases. Only one is the victim of much unsoundness, because only one works for man. Cattle, sheep, and pigs do not perform active labour, hence they rarely suffer from the class of defect under consideration. The horse alone works

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usually under extremely unnatural conditions, with the result that it is the victim of a number of ailments which are unheard of among other animals. These most commonly affect the feet and legs, as the limbs are the active agents of unnatural locomotion.

First of all, shoeing is probably responsible for more lameness than any other cause. Shoes raise the frog off the ground and prevent the concussion which is necessary to the health of this pad; they may directly lead to lameness through defective construction or attachment; or they may, by their shape (calks, etc.), cause strain and consequent lameness in some part of the leg. The mere concussion (emphasized by shoes) of trotting along a macadamized road must be very trying to all the ligaments, tendons, and joints of the horse's legs, so that the wonder is, not so much that there are so many unsound horses as that there are so many sound ones. It is hardly necessary to mention the other artificial conditions of life connected with the housing, feeding, and exercising of horses, to which the majority of the animals are for at least some period of their lives subjected. All lead to special ailments, which in their turn detract from the usefulness of the victims.

The point is that unsoundness is an acquired characteristic, and as such should, broadly speaking, not be hereditary. Theoretically, any peculiarity which results from the work to which an animal is put will not be transmitted to its offspring, so that, again, theoretically, the progeny of two horses with curbs will not inherit curbs. This is correct enough as far as it goes, and we do not believe that the most bigoted adherent to the view that acquired characters are transmitted would be able to bring forward proof of a young animal being born with the acquired defect of its parents. It must be borne in mind, however, that such a thing as curb is in almost if not in every case due to a faulty or weak construction of the hock. Usually it is caused by the sprain of a ligament, which ligament must therefore be in some way unsuited to the work required of it. The quality of ligament will be handed on to the next generation in a proportion of cases, and although the progeny which inherit it may never develop a curb unless they are put to as severe a strain as their parent, yet there will certainly be a latent predisposition to develop the defect under definite conditions. The same principle applies to all this class of unsoundness. The cause is hereditary, although the effect itself is not actually so. Thus, it is possible for an animal with a strong predisposition to an acquired defect to remain absolutely sound and useful all its life as long as it is not put to such work as will cause a breakdown in the hereditary weak point.

We have taken a somewhat roundabout way to arrive at the already accepted conclusion that disease and unsoundness are, broadly speaking, hereditary. It is popularly held that the latter is inherited direct from parent to offspring, and we have endeavoured to show where the fallacy lies according to modern opinion. The understanding of the matter is of some practical value to horse-breeders, because it by no means follows that because a horse has proved incapable of standing, say, severe road work that he may not sire excellent and sound animals for work on the land. On the other hand, mischief is done when a horse which has never done a real day's work in its life, i.e., a show animal, and which is yet unsound, is put to the stud, because in such cases the weakness must be extremely marked and will be inherited in its intensity by a proportion of the progeny. One is forcibly drawn to the opinion that animals which have gone through a severe training and yet remain sound are the only sort which are likely to improve our breeds, and it was adherence to this principle in the past which laid the foundation of our present stocks. The early domesticated horses, unadapted in every way to stand work or an artificial mode of life, must have developed every class of what we call unsoundness, and only rigid selection for thousands of years of the best has led to the production of a proportion of horses which, by their make and shape and other characteristics, are fitted to do what we expect of them.

In certain cases disease is actually bred for in domesticated animals. It may surprise some people to learn that fatness is a disease, and that the exhibits at our fat stock shows are all hereditarily afflicted with it. A certain amount of fat has been evolved in all animals in certain places, such as in the neighbourhood of the kidneys, where it presumably acts as a sort of protective cushion. Fat other than in these special places, however, is of the nature of a disease, and is formed from the decomposition of the protoplasm.

Reference to the Mendelian system of breeding will tell us of the shortest road to the breeding-out of disease. No matter whether the predisposition to contract a definite parasitical disease or an actual unsoundness is in question, either can easily be bred out by attention to these principles. The defective animal must be mated with one absolutely free (and its parents also) from the same predisposition. The defect may be dominant, in which case all the progeny will come with it; but on in-breeding them the breeder can feel certain that about 25 per cent. of the second generation will come free from the weakness, and that such will be pure in this respect and will never reproduce the disease as long as they are not mated with animals possessing it. If, on the other hand, the defect is recessive (does not appear in the progeny of the first generation), then the breeder may feel certain that about 25 per cent. of the second in-bred generation will possess it in its fullest hereditary intensity, and he will do well to weed out of his stud, herd or flock, all those individuals which come with it.

These facts in connection with heredity and disease suggest the importance of every breeder trying to find out the degree of delicacy, etc., possessed by the parents of any animal he intends breeding from. As just stated, a stud animal may be to all appearances perfectly sound, yet may be so bred as to hand on a recessive predisposition to some constitutional defect to a large proportion of his progeny. Further back than to the parents it is unnecessary to look; but breeders will be well advised to attach as much, or even more, importance to their hereditary tendencies as they do to the points of the actual animal they intend breeding from.—C. J. Davies, Live Stock Journal.

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Manures and Fertilizers.

The employment of manures and fertilisers in agriculture dates back several centuries, and we find Cato, Pliny, Homer and other classical authors advocating their use.

The materials used by the ancients were the droppings of domestic animals, and also the ashes of vegetable matter such as weeds and wood. These materials, and a few others, as lime, marl, gypsum, and green manures were used almost exclusively until 1840, when Liebig published his classical work, which gave the death blow to the theory that plants derived their carbonaceous matter from humus, and furthermore showed that continual cropping of the soil resulted in decreased productiveness owing to the removal of nitrogen and mineral constituents by the crops unless some restitution of them were made to the soil. "Scientific" employment of plant food in various forms may be considered to date from that year.

Probably the term "manure" is most correctly applied to materials which, besides supplying plant food to the soil, exert some beneficial physical action on the soil, for instance, the effect a dressing of farmyard manure has in lessening the effect of drought on a soil to which it has been properly applied.

The term "fertilizer" is generally used for mineral materials, which undergo some preliminary treatment, often chemical, before use; it must be admitted, however, that it is impossible to draw any hard and fast line between "manure" and "fertilizer," the two terms in many cases being indiscriminately used.

Farmyard manure consists of the solid and liquid excrements of farm animals, together with the litter, refuse of the food, and some earth and sand.

It is a "complete manure," i.e., one containing nitrogen, phosphoric acid and potash, the three substances which are more often needed in the soil than all others, since they are necessary to the growth of all crops, and are removed by the crop from the soil where they exist in very small quantities.

Farmyard manure varies greatly in composition. Its fertilizing value depends on:

1. The species of the animal.
2. The age and occupation of the animal.
3. The food supplied to the animals.
4. The sort and amount of litter used, and
5. The treatment of the manure.

1. THE SPECIES OF THE ANIMAL: — Horse manure, when fresh, is generally considered to be rich, since horses are fed highly; it rapidly decomposes, and unless the evaporation of water from it is kept low, it is subject to fire fang, whereby a considerable amount of the valuable nitrogen is lost by volatilisation as ammonia; for this reason, when stored, the manure should be tightly packed. For farm purposes it is better mixed with cattle-manure, which contains more water.

Cattle manure is slower in decomposing than horse manure, and therefore less liable to lose ammonia.

Pig manure is also slow in decomposing. Sheep manure decomposes somewhat less rapidly than horse, but more quickly than cattle manure.

Since farmyard manure generally contains the mixed excrements of two or more of the domestic animals, the fermentation of the hot manures is generally retarded by the cold manures, whose decomposition on the other hand is accelerated by the hot manures.

2. The age and occupation of the animal:—These two conditions of the animal have considerabl influence on the composition of it excrements: growing animals fo instance, retain far more of th fertilizing constituents of the foo for the production of flesh and bon than mature, fattening animals, o than animals in full milk.

— Seaweed. —

Along the coast seaweed is use to a considerable extent as man ure. As a source of plant foo it is rather richer in potash tha farmyard manure and equally de ficient in phosphates. It decom poses rapidly in the soil. Con tinued applications of seaweed ar apt to increase the amount of sal in the soil to an objectionabl amount.

— Poultry Manure. —

Poultry manure is a complet manure that is occasionally used It is considerably richer in plan food than farmyard manure, ow ing partly to the fact that n straw or other litter is used. I readily ferments, and for tha reason is best applied at once o mixed with loam to prevent los of ammonia.

Poultry manure that is washe by rain or kept for any length o time in a warm place will invar ably lose a great deal of its valu

— Tobacco Refuse. —

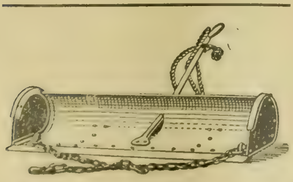
This waste product from the to bacco factories can often be pro cured at reasonable rates. It i more valuable, as a plant food than an equal weight of farmyar manure, but is too deficient i phosphates to be a well-balance manure.

— Composts. —

Composting since the advent o artificial fertilizers is far less ofte resorted to now than formerly.

The object of composting is t turn to profitable use refuse o various kinds which accumulates o the farm, such as bones, night soi leaves, etc.

A compost is made by mixin together waste substances of an mal or vegetable origin, rich i plant food, with peat, or loam



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lime or wood ashes being often added.

The materials in the compost readily ferment and are converted into forms of plant food available to the plant. In the past peat or muck was often mixed with farmyard manure, whereby the peat fermented, and its nitrogen was converted into ammonia.

Composts made of a number of different materials are naturally not of constant composition.

— Night Soil. —

Night soil is used to some extent as a fertilizer, and when it is properly preserved is of some value. Probably the best way of using this material is to mix it in with the farmyard manure.

— Green Manures. —

The use of green manures is very general. Clovers and other leguminous crops are considered best for this purpose for several reasons :—

1. They obtain the greater part of their nitrogen from the air, unless the land on which they are grown is already rich in nitrogen.

2. Many of them are extremely deep-rooted, the roots of lucerne or alfalfa having been traced for at least twenty feet. These deep roots obtain nourishment from the subsoil for the use of the plant, and when the crop is ploughed this plant food is returned to the surface soil.

Plants obtain the greater part of their organic matter from the air, and thus humus is added to the soil without being supplied from the farm.

A further great advantage of green manures is that while the crop is growing it takes its mineral food from the soil thus preventing loss by leaching, and this mineral food is returned to the soil when the crop is ploughed under. Again, after green manuring the land works very nicely and gives a good tilth with but little trouble.

— Materials Used to Supply Nitrogen. —

Nitrate of soda is the most common of the purely nitrogenous fertilizers used in this country.

Its value lies in the fact that it is available so that it does not have to undergo any changes in the soil before it is of use to the plant.

It is readily soluble in water, and is not retained by the soil, consequently it should be applied when it can be used by the crop and not before. Nitrate of soda has some action on the potash which is locked up in the soil, and liberates it to a limited extent for the use of the plant. Its continual use on clay soils is apt to render the clay very sticky so that it puddles easily.

— Ammonium Sulphate. —

Ammonium sulphate is used less frequently as a source of nitrogen than nitrate of soda.

It acts less quickly and for a longer period than the latter, but the nitrogen in it is generally considered of slightly lower value, since less of it is generally obtained in the crop ; on the other hand it is less easily washed from the soil. Before it can be utilized by the plant it has to undergo nitrification in the soil, a process which is rapid when the soil is warm, well cultivated and not too dry.

Sulphate of ammonia entails a loss of the calcium carbonate in the soil, and this loss becomes serious when the fertilizer is continually applied to a soil deficient in calcium carbonate and such soils are apt to become acid, and therefore rendered unsuitable to many crops ; an application of lime will remedy this.

Sulphate of ammonia may be applied somewhat earlier than nitrate of soda in order to allow nitrification to commence.

— Dried Blood. —

Dry blood also supplies a small amount of phosphoric acid. Like ammonium sulphate it has to undergo nitrification in the soil before it is available to the plant, and should therefore be applied a little while before it is needed.

— Other Nitrogenous Manures. —

There are some products now being manufactured, which are nitrogenous fertilizers ; among them may be mentioned calcium cynanamide, and calcium nitrate. They have not been very generally tested as to their efficiency, though indications point to their more general use in the future. The nitrogen in them is obtained from the air, which contains an inexhaustible supply of nitrogen, and they cannot but prove valuable when the supplies of nitrate of soda run short.—By H. S. Hammond, in Journal of Agriculture and Horticulture.

◆

An Expert's Opinion.

Rarey, the great horse trainer, had great faith in the system of tying up a horse's foreleg to tame him, and carried the practice to extremes. He says the animal so treated " will soon learn to travel on three legs, so that you can drive him some distance. As soon as he gets a little used to this way of travelling put on your harness and hitch him to a vehicle. If he is the worst kicking horse that ever raised a foot you need not be fearful of his doing any damage while he has one foot up, for he cannot kick, neither can he run fast enough to do any harm. . . . . If he wants to run you can let him have the reins, and the whip, too, with perfect safety, for he can go but a slow pace on three legs, and will soon be tired and willing to stop." These propositions cannot be denied, but we imagine that a spirited horse in such a situation would probably throw himself down to his own hurt.—Elder's Review.

◆

Pumpkins.

Experiments recently conducted at Iowa Agricultural College, U.S.A., have resulted in the production of a species of pumpkin which contains 4 per cent. of sugar. It is predicted that in three years the sugar element will be increased to 12 per cent., equal to the quantity procurable from beet. Pumpkins so rich in saccharine matter would be quite a godsend for the American jam factories, some of which, it is alleged, are now using large quantities without any regard to sugar contents.

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The Ant.

The ant has been quoted from time immemorial as the personification of industry, and held up as a model of ceaseless energy to all and sundry. As such the creature was regarded with endless respect, even prior to the publication of that classic work, "Lubbock on Ants." Since the publication of that work respect was forthwith intensified, until a discordant note was sounded by that irrepressible humorist, Mark Twain. He was the first to point out that the ant was more symbolical of that bustling type of individual who would never allow his brains to save his heels. In the overcoming of obstacles the ant was certainly unique, but there should be no occasion to set off in pursuit of altogether unnecessary obstacles for the purpose of climbing over them. Mark Twain pointed out that if an obstacle — which proportionately might be a mountain—barred the progress of the ant on its way home with the evening meal or the family firewood, and which might be easily circumvented, the ant charged straight ahead over the highest pinnacle, and dragged its load up and down with it. In consequence of flippant remarks of this nature on the misdirected, and therefore wasted, energies of the ant, the creature has lost many friends. It has, however, endeared itself to the lazy youth of the period—the born-tired section—as being no longer infallible: as a type of level-headed, industrious enterprise the ant and all its works can no longer be metaphorically cast at his head by an indignant parent rebuking slothful habits.

What the ant may have lost in the esteem of this class of individual, he has gained in the regard of public-minded mortals. Lubbock has been able to show the world that the ant's social and municipal system is one that is not surpassed by even the most perfect organization (nathless the City of Adelaide) in Australia. Police and scavenging, traffic and experimental works, provision for old age (practical old-age pensions), and the education of the young are but incidents in the system. In the bush on the subject of ants most mortals are scoffers, if not blasphemers, and it is difficult to educate public opinion, as represented by the boundary rider and the stockman, up to any pitch of enthusiasm regarding the habits of the creature. These worthies only know the ant as a ceaseless persecutor, bent on destruction, and the invasion of all that is most sacred and attractive to the daily routine of life—their rations.

Bushmen are familiar with far more varieties of ant—green, blue, black, yellow, and even white—than the ordinary citizen can ever hope to come in contact with. Their experience does not halt at colours, but extends to size, from the veteran bulldogs of the interior to the smallest variety that announces its presence when established high up the leg inside the trousers. Their aim in life is to avoid contact with the creature, and they pray fervently that it will worry along on its own account without arousing necessity for hostile interference. With the citizen it is different; his afternoon nap has not been frequently and persistently upset by any rude attack, his jam and sugar are better protected from invasion, and he is without practical experience of ants that jump, of ants that sting, or of ants that bite, and sting, and jump. Such an audience may be willing to listen to a peroration on the virtues of the ant. In its scavenging propensities they may detect some consuming force of a superior nature to municipal abattoirs, incinerators, or crematoria; in any case they are sure to discover some form of desiccation superior to the municipal dust heap. They may detect in the ant those higher aspirations of socialism, and the unselfish sacrifice of the individual in the interests of the community, which have been indefinitely postponed by ordinary humanity will the arrival of the millenium. The ants met with abroad, i.e., away from their own homes, are out working in the interests of scores of youngsters. The queen ants lay the eggs and the workers stack them away in such a position that as they hatch they may be properly fed. All the food gathered by these workers is stored in their crops, and served in a liquid and sweet form to the young. As the young ants approach maturity the strain upon the workers grows more intense and their next business is to drive forth the young to found families and cater for themselves.

And so the tale of colonizing goes on, and, if viewed at a safe distance is interesting enough to the student of political economy. To the bushman the subject has ever failed to appeal. Even among the more enthusiastic lovers of nature and all her creations the ant must perforce play second fiddle to the bee. The bee can win its way by yielding up its winter supplies of food, and can be tolerated as a likely producer of similar supplies in the future. But of

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the ant—even admitting that its whole scheme and organization is equally as wonderful in detail as that of the bee—few speak well, many speak freely, and too many speak profanely.—Elder's Review.

Someone once referred to the virtue of suffering fools gladly, there are, however, no points about suffering ants needlessly. What the attitude of the assorted ants mentioned above may be, we do not know but we can vouch for the fact that the ordinary domestic and garden varieties have a holy horror of London Purple. Dust a handful over any ant hole you come across and the trick is done. —Ed. G. & F.

◆

Stall v. Loose Box.

Opinions vary amongst owners as regards the merits of loose boxes or stalls for horses under ordinary conditions, though, of course, there are cases in which one or other is preferable. Some horses never seem to do so well in boxes, as they will wander round and round all the time they are loose, and others indulge in tricks which are calculated to bring disaster upon them. These, of course, may be kept tied up both by day and night; but in such cases a box is thrown away upon them, so they are always better off in every way in stalls. It must not be supposed, however, that there is no risk attached to fastening up a horse, as there is unless there are proper arrangements made for securing him. In the old days a hempen halter and rope were quite commonly in use, but the accidents which were associated with their adoption suggested better methods, and now a properly-constructed block or plug of wood is always to be seen at the end of the rope or chain which secures the horse. A good leather head stall may likewise be regarded as a necessity; but either ropes or leather straps are far preferable to chains for attaching thereto. The chains are so noisy, especially if the mangers are of zinc, that there is no rest for a nervous horse, or for human beings living near the stables, and therefore they should not be used; and though leather reins cost more in the first instance than the rope ones, they wear much longer, and therefore are cheaper in the long run. A horse not securely fastened up in the stable is a danger to himself and any other animals that may be in it: and an improper method of fastening him may be the cause of heavy loss to his owner.

Should Cows Be Stripped?

Should cows be srripped after milking or not? Discussing this question in an English journal, Professor McConnell, the eminent English dairy expert, says that he is one of those who all his life was accustomed to see cows stripped out by a responsible person, who followed after the regular gang of milkers; but recent events caused him to change his mind as to the advisableness of the practice. Many authorities have pointed out aforetime that, as the milk secretion was intimately connected with the nervous organization, the stopping of the milk and then coming back to start it again was doing the cow harm, as it amounted to restarting of the nervous energy. About a year ago Professor McConnell stated his belief that stripping was absolutely necessary. He now begs to take it all back, as since then he has tried his cows the other way, with the most satisfactory results. They are now milked out at one sitting, and if a small quantity be left in the bag, the Professor argues it does the cow no harm, but helps to swell the total yield at next milking time. If there is any possible gain then in stripping, he contends that it is discounted by the harm done to the cow by the stripper in starting her nervous force once more. Alongside of the cessation of stripping, however, another practice has also been abandoned—that is, the changing round of the gang of milkers, so that each cow is milked by each milker in rotation. Every man now sticks to his own lot of cows, and as one cow drops out and another comes in the lots are kept as equal as possible. As far as Professor McConnell can see, the results to the cows, to the milkers, and to the milk yield are eminently satisfactory, and he for one will not go back to the old system.

◆

Cheese v. Butter.

In a lecture by one of the New South Wales dairy instructors in the Tumberumda district, he compared cheese with butter making. "Assuming," he said, "the supply of milk to be 25,000 gallons, there should be 25,000 lbs. of cheese; cost of manufacture, including wages, ½d. per lb. This last year the average price of cheese has been 6d. per lb. Thus, 25,000 lbs. of cheese at 6d., £625; less cost of manufacture, £52 1/8; leaving net, £572 18/4, against 11,100 lb. of butter at 10d. per lb., £462 10/. Assuming that the cost of marketing the cheese is the same as for butter, there is a balance of £110 8/4 in favour of cheese."

◆

To get the most out of a horse it is necessary for the breeder to know how to fit him for the market, and also to know how to sell him.

◆

"What explanation have you," said the judge severely to the defendant, "for not speaking to your wife in five years?" "Your Honour," replied the husband, "I didn't like to interrupt the lady."

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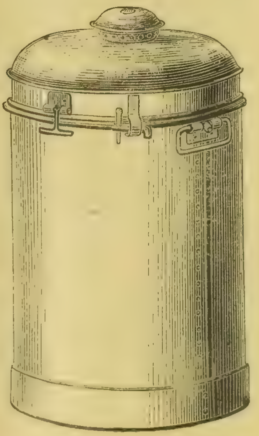

(Continued from page 313).

Feeding the Pig.

— Grazing Pigs. —

The method of management of pigs in the New World—i.e., the States and Canada—is, from the information contained in their agricultural Press, quite different to the general custom at home. It appears to differ more particularly in respect to the method of rearing and feeding the sow. There, the almost universal system is to graze pigs as we do our sheep and bullocks. An example of this method has recently appeared in the Country Gentleman, wherein a correspondent sets out a system of rotation of crops over a given area in order to provide sustenance for a certain number of sows and their offspring. The crops recommended to be grown are corn, maize, rye, and rape, vetches with clover sown in them, and clover—the latter three crops to be grazed, and the former to be used both in its green state and as corn during winter. Then, again, in other publications, where results of experiments have been given, one can learn that the system of grazing pigs is not only satisfactory, but also successful from the financial point of view.

If a practice of this kind has been so tested and tried, as has been the case in Canada and the States, why should it not be adopted here? Probably the reason most pig-men would give is that no one has ever done so on a large scale. Granted: but has it been tried to any extent? To feed off a field of rape, or vetches, or clover, with pigs may appear a novel idea, but why? The manure left by the pigs would be of great value, the crop would be consumed to the best possible advantage, and its product in the shape of pork would be sold at a rate quite equal to, if not in excess, of that which would have been produced by the feeding off the crop with sheep.

Another great advantage of this method of pork-production is that the sows and their pigs would be kept perfectly healthy, and be reared up in a far more natural way than when too much confined to styes.

— Artichokes. —

One of the very best crops a farmer can grow is the artichoke. It is splendid pig feed. It is easy to grow. From 500 to 1,000 bushels per acre have been grown. The pigs will harvest it. Once planted, it is there for life. Every man owning a farm ought to have his artichoke patch. Strange, indeed, it is so little known, and so few farmers avail themselves of this valuable aid to cheap bacon.

The Jerusalem artichoke is the best variety. It is a plant growing 5 or 6 feet high, resembling hemp. The tubers grow about the roots, and resemble knotty Irish potatoes. Many people are fond of eating them green. They make a fine pickle, but their chief value is pig feed. Select your patch on deep, rich, friable land; fence it with "pig-proof" fence.

The best way to make this fence is to put a stout wire netting, pig fencing, next to the ground; 18 in. to 22 in. wide will do: then above it two barb wires. This will make a cheap fence, and is the only sensible pig-proof fence I know of.

Having fenced in your patch, break it up, harrow finely, and lay off in rows 3½ ft. apart. Cut up the tubers, and plant about every 18 in. in the drill, cover shallow, and cultivate as you would maize. They grow all summer, and must be gathered late in the autumn. Plough them up, and gather as you would Irish potatoes; but they are far easier to keep than any potato. But it is a waste of time to gather them. Plough two or three furrows across the rows with a double shovel, and turn in your pigs; they will gather what they want, and will laugh and grow fat while doing it.

When pigs are taken off of any root crop, I care not what—even peanuts—they should be fed two or three weeks on grain. It will improve the bacon, making the fat harder and firmer, and also improve the lard. Pigs may root this patch all winter, yet there will be seed enough to re-set it next year.

When the pigs are taken off, plough the ground, harrow it down level, and in the early spring there will spring up a bountiful crop of young plants. If all are left to grow, the ground will be overcrowded and the tubers will be small, and in a few years will be a mere patch of artichokes. When the plants are a few inches high, plough them out into rows 3½ ft. apart; thin them out with a hoe to a stand, one stalk every 18 in., and cultivate. If this course is pursued, the artichokes will always be good. The rooting of the pigs will be a splendid autumn ploughing for them, and opens up the ground. Their droppings will keep it well manured, and the incorparating in the soil its annual crop of weeds and leaves will keep the soil rich and in fine, loose condition.

◆

Value of Lucerne.

The feeding value of lucerne is largely in its chemical compound known as protein; its extreme digestibility is another desirable quality to be considered, and not least is its appetising character. Not only do all animals like it, but when given in moderate quantities it seems to increase the general appetite for more fat-making feeds. Steers beginning to "fall off" on a heavy diet of maize will come to their appetites after being fed only a few pounds of lucerne daily, and will eat and assimilate more corn than before. Lucerne alone is not a fat-making feed. Animals fed upon it grow in weight, but the weight is principally of bone, blood, and muscle. It is without a sufficiency of fat and carbohydrates, and these should be added in such feeds as corn, corn meal, Kaffir corn, or Kaffir corn meal; sorghum or millet. When lucerne is fed alone all the protein cannot be digested, and, therefore, it is always economical to add some carbonaceous foods, if animals are to be fattened. —Coburn's "The Book of Alfalfa (or Lucerne)."

◆

Two young men were lunching together when one of them mentioned a mutual acquaintance. "Brown is a good fellow, no doubt," said the other a little stiffly, "but somehow or other he never appealed to me." "I suppose he knew it wouldn't be any use," murmured the first speaker. "You are usually broke."

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The Values of Manures.

— Resulting from Various Foods.

In an article published in the "Journal" of the Royal Agricultural Society of England, by the late Sir John Bennett Lawes, Bart., and Sir Joseph Gilbert, entitled "The Valuation of the manures obtained by the consumption of foods," the following table is published giving the value of the manure obtained per ton of food consumed :—

	£	s.	d.
Linseed	1	19	2
Linseed Cake ...	2	11	11
Decorticated Cottom Cake ...	3	14	9
Palm Nut Cake	1	6	4
Undecorticated Cotton Cake	2	5	3
Cocoa Nut Cake	1	19	10
Rape Cake ...	2	16	5
Peas ..	1	15	5
Beans	2	1	11
Lentils	2	0	8
Tares	2	1	1
Maize	0	16	7
Wheat ...	0	18	11
Malt	0	17	7
Barley	0	17	2
Oats	0	19	9
Rice Meal	0	18	6
Malt Coombs ..	2	6	7
Fine Pollard	1	15	2
Coarse Pollard	1	18	1
Bran	1	18	6
Clover Hay ...	1	7	0
Meadow Hay	0	18	7
Pea Straw	0	12	2
Oat Straw	0	7	5
Wheat Straw	0	6	8
Barley Straw	0	6	5
Bean Straw	0	11	5
Potatoes	0	4	1
Carrots	0	2	9
Parsnips	0	3	6
Mangel Wurzels ...	0	3	2
Swedes	0	2	11
Yellow Turnips	0	2	6
White Turnips	0	2	7

This table is of course on the supposition that the manure is properly kept under cover, and not left exposed to the weather to deteriorate. It will be readily seen that a large part of the outlay incurred for feed is returned in the value of the resultant manure, and also gives the farmer an idea of the amount of valuable fertiliser he is allowing to go to waste by not taking means to save the droppings from his animals. Take, for instance, bran and pollard, which, taking an average value of £7 per ton as a food, yield a fertiliser worth £1 18 per ton, which considerably reduces the cost of the food. An animal would not be fed on bran alone, but it would be mixed with a proportion of roughage which would reduce the value of the fertiliser as well as the cost of the feed. By calculating the amount af food consumed per day or week, the value of the manure obtained from any animal may be approximately obtained.

Other substances available as a fertiliser and often wasted are :—

Deposit from wool-scouring tanks.—The analysis gives nitrogen .64 per cent., potash .72 per cent. ; and the value is about 13/- per ton.

Wool waste from shearing sheds contains 8 per cent. of nitrogen, and is worth £5 10/- per ton.

Skutch from limed pelts (tanners' refuse) gives nitrogen 1.8 per cent., phosphoric acid .89 per cent., potash .20 per cent. ; value, 30/- per ton.

Decomposed hair and lime from tannery contains nitrogen 6.86 per cent. ; value, £5 per ton.

Tanyard refuse contains nitrogen 2.24 per cent., phosphoric acid. 67 ; value, 31/- per ton.

Fowl manure contains 1.47 per cent. of nitrogen, 1.94 per cent. phosphoric acid, and is worth about 27/- per ton if well preserved, but the quality varies considerably.

Nightsoil mixed with lime contains nitrogen .74 per cent., phosphoric acid .78 per cent., and it worth about 13/- per ton.

Decayed bark and leaves vary according to the variety of timber from which they are obtained, and generally contain a small percentage of nitrogen and vary in value from 8/- to 10/- per ton.

◆

Worms in Pigs.

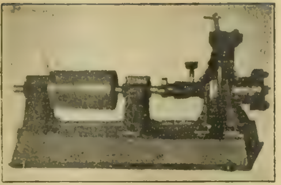
Among the parasites which affect pigs, worms cause a great deal of trouble, and it is doubtful if pig-keepers realise the extent to which the health and lives of their animals are menaced by these pests. Their presence is made known by lack of appetite, a hidebound appearance, a tendency towards coughing, fretfulness and irregularity of the bowels. A strong medicine is necessary to dislodge the pests. For this purpose a powder or preparation of some sort should be procured from a responsible chemist or veterinary surgeon. When the medicine has had the desired effect, the patient should be given nutritious food and a comfortable bed, and, if possible, a little exercise. Charcoal and other grit and vegetable food are always advised.—"Exchange."

◆

After all, there is no place like the farm, and no people like the farmers. The noble traits of rural character, born of natural environment, and strengthened by wholesome, self-reliant occupation, are a nation's safeguard.

◆

Husband—"How conceited you are, Effie ! You're always looking at yourself in the glass." Wife—"I'm sure I'm not. I don't think I'm half as pretty as I really am !"



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Preparing Horses for Show.

By Alexander Galbraith, in "Canadian Farmers' Advocate."

The old-time cook, in advising her friends how to make hare soup, naively suggested that they should first "catch the hare." This advice may well be given in connection with the fitting of show horses, it being an equal necessity to have, first of all, the proper material for the purpose. One great trouble with many unsuccessful exhibitors lies in the fact that their judgment is more or less defective in choosing the material for a show horse. And, while a great deal can be done by skilful feeding and handling to bring out the best there is in any draught horse, and make him look especially attractive, there is, of course, a limit to this.

Presuming that the horse must be made fat in order to show to the best advantage, it is absolutely essential that, however faulty his top may be, his legs and feet must be sound and good. This goes without saying, and for the simple reason that, unless the foundation is sound, the heavy superstructure, when built on, will only prove a detriment and an aggravation.

But, presuming that a suitable animal with "good understandings" is provided, the first step towards making him a show horse is to ascertain if his health is good, his blood in perfect order, and his capacity to assimilate nutritious food satisfactory. It may be advisable to have his teeth examined professionally. The next step is to examine his action—both walking and trotting—and if there is any defect which prevents him going perfectly straight, seek to have that rectified in shoeing. Remember that absolutely straight, level action, both "fore and aft," is demanded by all expert horse judges. There must be no paddling, nor toeing out, nor toeing in, and the hocks should always be carried straight and pretty close together. Wide hock action, or a tendency to "bulge out" at that joint, whether walking or trotting, is simply unpardonable in a high class draught horse.

— Foods and Feeding. —

In fitting a horse for show purposes, considerable latitude must always be allowed the fitter in regard to the kinds and quality of food used. Some prefer cooked food, while others of equal experience condemn it, as not only unnecessary, but dangerous. My experience and observation indicate that the best results are got more promptly and more economically by giving the animal cooked or scalded food once in twenty-four hours, but not oftener. There is a danger in feeding cooked food too frequently. It affects the digestion, and causes colic. I have seen horses shown in the "pink of condition" whose food for some months consisted principally of oats, bran and boiled sugar beets. I have seen other horses in equally good condition that had received no cooked food whatever, but simply oats, bran and hay. A few—but only a few—raw carrots are an excellent alternative; carrots fed liberally will prevent rather than assist the horse getting into show condition.

Some exhibitors use molasses and various condiments freely and successfully. I think these also should be used judiciously, and in great moderation. As a fattener maize has few equals, but I do not advocate its use generally for show horses, it being too heating.

The essential things for the fitter to observe closely are:—

First—That the food is being thoroughly digested.

Second—That no more is crowded into a horse than he has the appetite to clean up, and the capacity to assimilate.

Third—That he is regularly and thoroughly groomed, and receives sufficient daily exercise to keep him in perfect health, and prevent his legs from "stocking."

Fourth — That the horse be weighed frequently, and, if not increasing in weight, his feed ought to be changed or modified somewhat. A horse's perfect condition is evidenced by a bright, clear eye, a brilliant coat, high spirits and mettle, and sufficient flesh to thoroughly "round him out," but not enough to interfere with the slightest degree with his natural action, which on no account must be impeded.

◆

The Soil and Disease Germs.

In certain respects the soil is the best natural purifier known, but it is perhaps insufficiently recognized that it may also be a medium for preserving and propagating the germs of diseases to which animal life is subject. We are assured by scientists that the surface soil teems with micro-organisms, the great majority and predominating species of which are beneficial to vegetable and harmless to animal life. Indeed, these descriptions of bacteria are necessarily and inevitably present in every fertile soil, and the fertility of the land may be regarded as rich in proportion to their multiplicity and activity. But it is also to be recognized that the soil—and the cultivated to a greater degree than the virgin soil—may harbour harmful as well as beneficial micro-organisms, although the former are seldom present unless they have been communicated by some outside agency. Some varieties of them may be indigenous or natural to the earth, but the majority of those really harmful to animal life only use the soil as a place of refuge during the intervals between their escape from one victim and their seizure of another. Thus the earth is less the breeding place of dangerous bacilli than simply the harbour in which they can live in a more or less inactive

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condition for an indefinite period. The fact that they continue alive, though inactive, in the soil renders it of the highest importance to stock-owners that every known precaution should be taken to prevent the land from becoming contaminated with the bacilli of the diseases that have shown themselves capable of living therein.

In a lecture on this subject, which he recently delivered to the students attending the Aberdeen College of Agriculture, Mr. J. M. Young emphasized the necessity of dealing in a prompt and drastic manner with those animal diseases that can be preserved and spread through the medium of the soil. He singled out for special mention the dread diseases of tetanus, anthrax, and blackquarter. Perhaps of all dangerous bacilli that of tetanus, or the common lockjaw, is the most prevalent in the soil, and the fact that this fatal disease is, happily, of such rare occurrence Mr. Young ascribes to the circumstance that the mere entrance of bacilli into the body did not necessarily involve the development of tetanus. Disease only resulted when the bacteria were accompanied by foreign matter, and hence the significance of promptitude and thoroughness in the washing and cleansing of any wound caused by contact with the earth. Anthrax and blackquarter are more important from the stock owner's point of view, as there is no doubt that these terrible diseases are frequently contracted by animals from contaminated soils. The anthrax bacilli are comparatively easily starved out if proper precautions and measures are taken for destroying the carcasses or blood of infected animals. The all-important point in the case of anthrax is to prevent the escape of blood or the exposure of blood to the air, either before or after death. So long as they are confined to the body of their victim the bacilli are innocuous, and in due course would completely die out; and hence, as Mr. Young remarks, the desirability of regarding every case of sudden death as attributable to anthrax until otherwise proved by a microscopical examination of a drop of blood. An anthrax animal, provided its body is kept intact, need not necessarily become a source of fresh infection; but if, on the other hand, the body is skinned and the blood permitted to escape into the soil, there to lie in wait for future opportunities of attacking fresh victims. As to the disposal of anthrax bodies, there is no doubt that the most effectual method is to burn them entirely; but if the regulations of the Board of Agriculture as to burying them 6ft. deep in quicklime were strictly carried out, the danger of spreading infection would be largely, if not completely, removed.

In some respects the bacillus of blackquarter is even more deserving of strict supervision than that of anthrax, for the reason that it is capable of living for a longer period in the soil, and is more likely to escape into it from dead bodies. It is not so prevalent, fortunately, but it is equally hateful and fatal, and farmers whose stock have contracted it cannot be too careful and exacting in dealing with the infected carcasses, and in guarding against future contamination of other stock. Living animals suffering from one or other of these diseases are inevitably a likely source of fresh infection; but if prompt and effectual measures are taken after death for disposing of the bodies the risk of contaminating the soil would be appreciably diminished, and, surely, having regard to the ruinous and terrible nature of the maladies, stock owners should readily recognise the desirability of complying with the methods advocated by scientific experts in disposing of the victims of these diseases.—London Field.

◆

Animal Instinct.

Neither horses, cattle, nor sheep appear to place very much faith in sense of sight, but they make keen use of the faculties of smell and hearing. A mare separated for a short time from her own foal must have a sniff at it to begin with if the young thing is in a group of like age. A cow will act in the same way with her calf, and so will a ewe with her lamb. From the merely human point of view, a newly-clipped ewe looks a little odd when searching for a lamb with a patch of black on its shoulder or with a dark "collar" on its neck. The ewe disregards all markings and outward peculiarities; she simply "noses" her way until she finds her own.

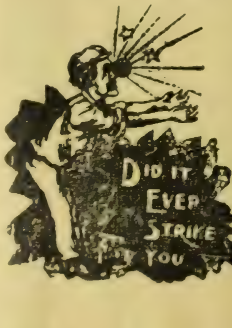
◆

Beet Pulp.

The dairy cow ration is always a live subject among our readers (writes an American exchange), and we want to make a suggestion in that direction. We suggest that every dairyman who isn't using dried beet pulp in his ration would do well to investigate this supplementary feed to make sure that he isn't missing something. While dried beet pulp is no new thing as a dairy feed by any means, still it is only recently that its use has become general, and we think it has now thoroughly established itself in this country, the same as it has in Germany, Denmark, and other European countries. To fully appreciate why dried beet pulp is such a profitable feed, one must realize that, in addition to its food value, it is a great aid to digestion and assimilation. Its light, succulent, "green" character relieves the compaction of the other heavier foods, and is a great aid in the mechanical operation of the stomach. Its cooling, soothing effect upon the entire ailmentary canal prevents any feverish condition arising, keeps the bowels regular, and the animal in a general state of thrift.

◆

Little Johnnie—"Papa, what three large cities are on the Mississippi River?" Papa—"I don't know, my son." Little Johnnie—"Now, I'll get licked at school today on account of your ignorance."



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The Fat Pig.

It is to be feared that notwithstanding the enhanced prices of the past few years, far too little attention is yet given by farmers to the proper treatment of the "gintilmin" who helps at least to pay the rent, even in Great Britain. When we come to consider more closely the value of stock in the so-called minor details about the farm such as pigs, poultry, etc., we find that a greater percentage of income is derived than from the more fashionable and higher valued departments. In districts around our large cities dairying is carried on by selling milk direct to the consumer, but in some very remote districts that is impossible, as railway transit is inconvenient and expensive. To the rescue of the outlying dairy farmer has come the pig, and without it the enterprise will not succeed. There is a good market for home-made butter of good quality and skim milk yields a quicker return in pork than in any other way. At almost every farm a pair of pigs are kept for the purpose of using up food which would otherwise go to waste, but in many such cases little attention is paid to the variety or breed most suited for the district, or most valuable as a product from the farm. The difference between the show-going pig and the average specimen that passes through the auction mart sale must have struck anyone with any knowledge of agricultural matters.

The shorter the term of life of the fat pig the more profitable will it be to its owner. There should not be in its life a growing and a feeding period; its existence should be a continuous record of increase in size and flesh. A long store period necessitates a long fattening period. A very general mistake is that too large a quantity of food is given at one time to young pigs newly taken from the sow. Two or three meals a day are not sufficient at this period. They suckle the sow from ten to twelve times a day, and their stomachs cannot stow away a large quantity of food at once. Giving too much food at a time inclines them to be lazy and to develop a trouble very common in many districts popularly termed "gout." Especially in the winter time it inclines them to lie too much in their nest, and they soon go off their legs and are practically of no use for any purpose. The systematic and frequent giving of very small quantities of food is more natural to them and keeps them active at a period in their life in which they are most liable to contract the "gout" trouble. Youngsters bought at 10/ to 15/- each and sold at 70/- to 80/- each in four months is the ideal at which expert feeding should aim. It is very difficult to work out any set rule as to the quality and quantity of food, owing to the fact that so much of the stuff fed may be classed as refuse. The feeding must be governed in a large degree by former results, although certain lines must be followed at the outset. The feeder must have at the start some idea as to what he intends to produce, either small porkers, pigs for bacon, or pigs for breeding. They must be kept going forward, as a set-back means a great loss of time and they will require much attention to bring them into condition again. Pigs are nothing short of machinery for converting the carbonaceous compounds into fat, and nitrogenous substances that build up the flesh must be given in a concentrated form.—English Exchange.

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◆

The Fly Torment.

Flies on horses' heads and other parts are a real torment, and a fortune still awaits the man who can discover a remedy that is at once harmless and lasting. Protection may be obtained by sponging over with any of the coal-tar emulsions. All these things on horses' skins dull the coat and attract dust for the time being; but it is a choice of evils, and one had better put up with such trifles than have horses worried with flies.

◆

With a lot of money invested in farm machinery, why is not all under cover?

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Poultry Notes.

Hatching Failures.

"Never count your chickens before they are hatched" is an admirable proverb so far as it goes, though it might be added never to count on the chickens growing up, for casualties are sure to occur. Still, it is something to get them out of the shell, and we will in this article confine ourselves to this particular stage. As every poultry-keeper knows, after the first testing, when the unfertile are removed, there are three probabilities before the egg. The germ may die before the chicken forms, in which case we call the egg "addled"; it may get as far as a chicken, and that chicken die before it can break the shell, or it may finally produce a chicken. Somehow the poultry-keeper always grieves far more over the "dead in shell" than over the addled, which are hastily buried, for they smell very unpleasant. It seems a great pity when opening the shell to find a complete chicken dead within. Why did it die? the owner asks. Well, there are a variety of reasons; the eggs may have been chilled at a critical time, or the moisture may have been inadequate or too abundant—the last when the eggs are in an incubator.

Provided all is going on well within, on the nineteenth day the owner looks anxiously for "stars" upon the shells. A tiny round place about the size of a three-penny bit, attacked by the chicken's beak within, is being forced outwards, the skin holding the splinters of shell together. It is always a good sign when eggs begin to "star" early, for it shows the chicks are forward, and therefore vigorous. One always likes to see them out of the shell before the twenty-one days are up. Nevertheless, the delay of a day or two does not mean failure, but merely that the growth for some reason has been retarded; a slight chill perhaps has done it, or prevalent east winds during the period of incubation have the peculiar effect of checking the birth of the chickens.

When the chicken has driven its beak through the point it has first attacked it starts pecking from that point all round, and finally bursts off the cap, as it were, and emerges. This cap is at the broad end, and composes between a third and a quarter of the egg; at any rate, there is ample room for the chicken to tumble into the world, and this it forthwith does. But it has not always the strength, though it has the instinct, to get out. It can only do so when all the conditions are favourable. Ideal conditions are a nest in a shady spot in summer, when the hen steals a nest; then she is always sure to hatch every fertile egg. The eggs then draw a little moisture from the ground, and this helps to soften the membrane of the egg, which generally presents more difficulty to the chickens within than the hard, brittle shell. But it is not absolutely necessary for a hen to sit on the earth. She often brings off a successful hatch in a dry loft, or in a shed, or somewhere where the eggs lie on dry straw, and nothing else. The reason is she gives them a certain amount of moisture from her feathers, as a rule, and her body always exudes what is known as "hen oil," which has no doubt a beneficial effect upon the egg. Provided a hen sits well, there is less fear of cases of "dead in shell" than in an incubator.

They often occur in the latter, especially when the machine is not a thoroughly reliable one, for which reason second-hand machines should always be bought on trial. It is not enough for the incubator to maintain an even temperature. It may do so the whole three weeks, and fail to hatch a single chicken. It is largely a matter of adequate moisture; when there is too little the membrane gets very hard and tough; when there is too much the chicken gets very moist, and seems too big for the shell. It chokes, as it were.

The head of the chicken should be near the broad end of the egg, but sometimes it is formed at the other end, and then it is ever so much harder for the chicken to get out. It nearly always wants assistance, and this brings us to the last point, does it pay to assist chickens out of the shell? If the operation is clumsily performed the chicken is as good as dead, and the mere fact of its having to be performed shows the chicken is not strong. There is, then, a pretty heavy death-rate on "assisted-out-of-shell" chickens, and one should never be in a hurry to do it. But if on the twenty-first day, when most of the chicks are out, while others give no sign of breaking the shell, ascertain by means of a pail of warm water if the chicks within are alive or not, and if they are, having wiped the shell, give the chicken "a lead" by breaking the shell with the point of a penknife whereabouts you think the beak is. Do this very gently, so that the point of the blade does not stab the chicken. If the hole is made near the top of the shell, should the beak be not hit upon, it can generally be seen, and a second hole can be made liberating it more. Then, should it have made no further progress, some hours later help it further by breaking away the shell. It can then be put back again, and will probably then find its own way out. The same remarks apply to ducklings' eggs.

Remember stale eggs and those from inbred fowls contribute largely to cases of "dead in shell." The moisture may not be to blame at all, but merely the vitality of the chicken is not normal. In such cases, and when the chicken has to be assisted out of the shell, it is seldom any good, and "fades away" like the husband of Mr. Pickwick's landlady.

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Now is the time to keep a plentiful supply of green food before your fowls.

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TICK

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Poultry Manure.

The value of poultry manure is too often lost sight of, particularly by the suburbanites, to whom the small quantities available from the home pens hold a peculiar value for promoting plant growth. Some facts published by the London Field show that weight for weight the droppings of poultry are superior to other manures produced on the farm. It was shown by the late Dr. Voelcker that a sample of fresh manure contained an eighth part of its weight of sand and 6 per cent. of moisture, but that the organic matter contained over 2 per cent. of nitrogen, while the phospnate of lime reached 3 per cent. When partially dried, as it usually is where it is kept in casks for future use, a sample contained 4½ per cent. of nitrogen and 5 per cent. of phosphate of lime, so that 100 lbs. should be worth, at the market price of these two materials, 3/6, without regard to the value of the potash. Farmyard manure, consisting largely of straw, and containing 50 per cent. more water than fowl manure, is usually valued at 5/- a ton, or practically 3d. per 100 lbs., but to this value something must be added to to represent the value of the straw, which assists in the improvement of the texture of the soil as well as in the production of heat, for which reason horse-dung is so largely used by market gardeners. The following are the results of Wolff's analyses of fresh manures, including litter per 1,000 lbs.:—

	Nitrogen.	Phosphoric Acid.	Potash.
Cattle	3.4	1.6	4.0
Horse	5.8	2.8	5.3
Sheep	8.3	2.3	6.7
Pig	4.5	1.9	6.0
Poultry	16.3	15.3	8.5

Sheep manure, which is usually extremely dry, contains only one half of the nitrogen found in fowl manure, while in all cases the proportion of phosphoric acid is small as compared with that present in the droppings of the fowl. Potash alone is approximately near. Fowl manure is much superior to the droppings of the duck, while the excrement of geese contains only half the nitrogen and less than half the phosphoric acid found in duck manure, although the percentage of potash is larger than in the manure of ducks or hens.

Fowl manure is excellent for use in the garden and especially where it is spread thinly in the drills in which seeds of those varieties of plants are sown which depend largely upon phosphates for their subsistance, beans and peas in particular. Owing, however, to its richness in nitrogen it is well adapted to plants with abundant foliage, such as cabbages, broccoli, cauliflower, and turnips. It is also useful for the potato, which demands a complete manure, i.e., one which contains large proportions of nitrogen, phosphoric acid, and potash. The late Sir Walter Palmer made a close study of the value of poultry manure and collected important facts upon his own poultry farm. It was found in one investigation that the manure produced by 31 hens of average size, kept in a field house, between 6 p.m. and 7 a.m., weighed 4 lbs. 10 ozs., or about 54 lbs. per hen per annum. Of these hens six were kept in during the day, with the result that they produced 4½ ozs., or about 17 lbs. per bird per annum. On this basis a hen providing 71 lbs. per annum would make a money return equal to approximately 1/4. Where manure is the produce of fatting birds it is richer than that from hens at liberty, and at the same time larger in quantity. Thus, 11 birds kept in fatting pens produced 6 lbs. 15 ozs. of manure in 48 hours, or at the rate of 115 lbs. per annum. As this contained 5.7 per cent. of nitrogen, 8 per cent. of phosphoric acid, and 18 per cent. of potash, quantities which are quite impossible in the case of laying hens, the returns from the manure alone would be equal to 4/2 per bird per annum.

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Why Not Go In To Win.

The amount of pleasure and profit which we derive from the breeding of standard bred poultry depends altogether upon the amount of energy and enthusiasm which we put into the work. Without these two things, failure will be the result. And if the poultryman does not have something of the fancier in his makeup, he will not be able to scare up much energy and enthusiasm, all of which is equivalent to saying that if you don't like chickens you had better not try to keep them. The successful breeders in any branch of live stock raising are the ones who are in love with the work. There are many people who do have a love for fowls who are killing it by careless methods and lack of a little study of the needs of their feathered charges.

It is to this class of breeders we want to speak and upon whom we want to urge the necessity for a little intelligent study of the conditions under which the greatest success is obtained. Very few people can admire a lot of scrub chickens and there is certainly very little in them to excite admiration on the part of anyone. Therefore, good stock is the foundation upon which to build. Standard bred stock means birds of uniform size, color and general appearance. Culls, cripples, runts, and all other undesirable birds in any flock should be killed or otherwise disposed of, and in this way one of the prime causes of failure

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Barred Plymouth Rocks: Special Exhibition pen. Ckl, 1st and Sp. at Victoria P. & K. C. Show; 1st and Medal Essendon Show, Vic.; 1st and Sp. Adelaide P. & K. Club Show, 1911; Hens and Pullets, all winners, P. & K. C. Show, Adelaide, 1911. A limited number of settings only. £2 2s. per setting; Good Utility, £1 1s.

Buff Orpingtons: Birds have won prizes whenever exhibited. Good sound color and healthy stock, also good winter layers and splendid birds for Export trade. 10s. 6d. and £1 1s. setting.

White Leghorns: My Roseworthy pen averaged 220 eggs per hen, and are now mated to cockerel of well known laying strain. 7s. 6d. per setting.

White Plymouth Rocks: Snow-white birds, easy to breed and rear, typical Farmer's fowl, good Winter Layers and excellent Table Birds. A few settings only to spare at £1 1s.

White Orpingtons: Imported and prize-winning stock. Won 1st Ckl, 1st Pullet Royal Show, Adelaide, September, 1910. Great Winter Layers and good Table Birds. 10s. 6d. and £1 1s. setting.

Pekin Ducks: Never beaten in show pen. Four Firsts, 1 Second, 2 Sp. at P. & K. Club Show, Adelaide, 1911, out of five entries. Two Firsts, 1 Second and Special at Royal A. & H. Show, Adelaide, Sept. 1910, out of three entries. A limited number of Settings at £2 2s. Good Table Birds, specially mated, suitable for Export trade, 5s. per setting. Reduction for quantities.

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will be removed, because the harboring of such specimens is often the means of the breeder unconsciously becoming disgusted with his flock.

Then, again, the surroundings in which the fowls are kept have much to do with the measure of success achieved. If the breeder has unlimited range for his stock, there is not so much opportunity for failure by reason of filthy and insanitary houses and yards, but where the birds are kept in confinement and especially in the average town yard, these things have much to do with the matter. Dirty, tumble-down houses, ill-smelling, filled with vermin, overcrowded and wholly unsuitable for any living thing, are often found as the only shelter made for the fowls. Yards that are in this same class are generally found in connection with such houses. At this season of the year they are hot and dusty or the earth is packed hard as a rock, according to the nature of the soil, and where no shade of any kind is provided, it is impossible for the fowls to exist in them. What enjoyment is there in working around such a poultry place, and who can bring in his friends and point to it with pride as an example of the pleasures connected with poultry keeping.

From the standpoint of financial profit it is absurd to expect results from such a condition of affairs. The hens will never lay enough eggs to pay for their keeping, and as for producing show birds under such surroundings it is time worse than wasted. And ye many people wonder why they fail. One of the first requisites for creating an interest in the work is a clean, well-arranged poultry house, with yards of proper size and kept in a sanitary condition, and all details necessary for the comfort of the fowls properly looked after. The next is a flock of birds, every one of which is a creditable specimen of the variety it represents, and a flock not too large for the available houses and yard room.

Then there must be an earnest desire to accomplish results above the average and there must be sufficient energy to back up this desire with action. First of all, know at what you are aiming and then keep plugging away t results come. The poultryman has no business becoming easily discouraged, and he should not expect to accomplish wonders in a day. He should make up his mind that what others have done he can also do, and that he will learn from his own or others' experience just where the pitfalls are and avoid them. The idea is that there is no good reason for going into matter half hearted. There is plenty of room at the top. The breeder who can produce fowls that will win the prizes at the various poultry shows each season is assured of financial success as a reward for his labour, and he also secures what to many is more to be desired, namely, the admiration of his competitors and the public acknowledgment of his superior skill as a breeder. Then why not go in to win?

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Ducklings for Stock.

Before the hatching season gets further advanced, a word to farmers and other duck rearers may not come amiss. Early hatched ducklings usually make the finest stock birds the following breeding season. Great care ought to be taken that they are not rushed forward by forced feeding. In a great many instances the ducklings reserved for breeding are those that are left after selecting the biggest for market, and which all along have been subject to confinement and over-feeding. This class of breeding stock can, at the best, only produce small, puny offspring. They may have come on to lay very early, which is also very undesirable, but which is often looked upon as a point in their favour and a good reason for keeping them. For stock purposes, select those ducklings who all along have had their liberty and been fed judiciously.

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Shade.

With the promise of a hot summer before us, the necessity of an effective shelter from the sun's rays and hot winds becomes evident. Fowls are very susceptible to an excess of heat, especially if that heat is of a direct kind. It therefore behoves the poultry keeper to provide his birds with something that will ward off the sun's direct rays, and save them from the scorching blast. Most poultry keepers of experience are careful to provide proper shelter, but many others who keep poultry never apparently give their fowls a thought except to growl at the absence of eggs. The birds have to stand about more or less in the open, subject to heat, bleak winds, or pelting rain. Apparently, too, the ground on which they remain all the year through is never cleansed, nor have they the benefit of grass in the run.

It is quite evident that such a mode of keeping fowls is neither humane nor profitable. Poultry naturally seek shelter in common with other members of the feathered tribe. Without it they will not prove profitable.

The ideal shelter is natural shelter. Thick bushes or pine trees give all the protection from heat, wind, or cold that fowls require, but should such natural shelter not be available, a substitute may easily be found by the placing of boards, etc., to ward off unsuitable weather. Just at present there is nothing better to plant than one or more varieties of the bean tribe, Asparagus, Lima or Cossack which should be supported on an overhead wire framework.

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Feeding.

Let "variety" be the watchword. As variety is the "spice of life," so it is likewise the price of success in feeding. Variety of green food, variety of whole grain in litter, variety of ground feed in hoppers, with a slightly moistened mash two or three times a week, keeping the fowl's appetite always whetted for something new. By this system, when all other conditions are normal, we believe the greatest good to the greatest number of fowls will result in the greatest number of eggs. But, above all, avoid extremes and hobbies, and use common sense as well as hen sense in caring for fowls. And so systems and methods come and go, like the seasons. They scatter some truth, and the great poultry industry goes marching on, working out its destiny and filling its great mission, and its evolution continues. — Myron H. Bent, in American Poultry Advocate.

A. R. CRESWICK,
DENTIST
(Late with Eskell & Tattersall).
VICTORIA SQUARE W., ADELAIDE.
(Near Post Office).
ALL WORK GUARANTEED.

Artificial Teeth made and misfitting Teeth remodelled. Teeth Scaled, stopped and Extracted. Laughing Gas administered. Painless Extraction.

Consultation and Advice Free.

Country districts visited regularly. See dailies for dates.

Hastening the Moult.

The Americans are making experiments with the view of throwing the hens into moult before it would occur under natural circumstances. If this can be done it would greatly add to the profits of poultry keepers. The winter eggs at 1½d. to 2d. a piece is the one that pays, and if hens could be put through the moult in the summer they would commence to lay again by about April, and continuing through the winter put out the profitable eggs. At present it is the exception to see anything laying in May, June, or July but the young stock, although cases have occurred where birds that moulted early have come again for the winter laying, but such cases are not numerous.

Almost everything else in Nature has been helped by man, and he should be able to throw hens into moult a few months ahead of their ordinary time table. Where a broody hen is put down in January it is generally found that she will go into moult before laying again, and she is thus available for winter laying, and it can be done with good results in all the sitting breeds. With non-sitting breeds, if you can throw them out of laying in December or January it will also be found that soon after they stop laying they commence the moult. To stop them laying is the trouble, but as the eggs are only worth 8d. a dozen at this period, it is worth while persisting in moving them about, in cutting out the animal food, and reducing the green stuff; in fact it is worth a lot of effort to stop the halfpenny egg for the twopenny one, which you do not get from a hen when she moults at her own time. Removing the birds to dense shade will also help to force the moult.

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Ducks are easily raised, and cost but little more than chickens. They grow surprisingly fast, and apparently are not affected by neglect, requiring only a reasonable amount of care with plenty of good substantial food and water.

Poultry Notes.

Remember there is an art in feeding to get the best egg results.

Keeping fowls busy is the secret of keeping them in sound health.

The systematic poultry keeper is he who never retains a fowl beyond a profitable age.

Whatever the season it is essential to maintain strict sanitary conditions in the poultry yard.

On the average farm a laying flock can be maintained with little cash outlay.

Well fattened and well dressed poultry will bring the best prices from the best customers.

It is folly to imagine that you can succeed with poultry unless you give close attention to feeding and housing.

Variety is most certainly the spice of food, if not of life, where poultry is concerned.

Prolific egg-production and constitutional vigor are the items to aim at in poultry raising.

It is surprising what an amount of meat—good, juicy tender meat—can be carved off a fattened fowl.

Systematic poultry raising consists not only in handling stock on proper lines as regards treatment, but also in producing results that are financially satisfactory.

Neglecting your layers is a losing proposition. It calls for special effort so bring a bird back to normal egg production once she has been neglected.

Hens one to three years old are the best breeders, at least so many people consider.

Coal cinders are a good grit, and hens prefer them to the best that can be made.

Try feeding millet seed to the little chicks. It can be grown very easily.

Maize meal and bran mixed well together and scalded makes a good morning meal for incubator chickens.

WANTED TO SELL.

INCUBATORS AND BROODERS, Simplex, awarded first price (silver medal) Adelaide Exhibition, 1910. Agent for Cort's Patent Cooler-safe, a boon in summer. Send for price list.—D. LANYON, Manufacturer, 46 North Terrace, Kent Town. 6-12.

The greatest need in the poultry work of to-day is strength and vigor in the stock.

Are you going to keep the early cockerels all summer simply for the sake of their society?

Many a hen that is otherwise well fed may fail to lay on account of lack of water.

Use plenty of dry earth in the hen house and coops. It is a purifier.

Eggs hatched by hens require 21 days, ducks 28, turkeys 26, geese 30, pigeons 18.

Soft pine shavings, sprinkled with diluted carbolic acid, makes a good nest, and is not troubled with vermin.

The wise attendant will open the incubator during hatching time only when necessary, and not permit meddling by outsiders.

Stout bones indicate strength, and chicks that have strong and thick thighs will nearly always make vigorous and healthy fowls.

Fowls must be well fed. But an over-fed fowl is not a well-fed one. Remember that.

The slipshod poultryman is the first to raise the cry that the poultry business is a failure.

When the ducklings pip the shell they do not emerge at once, as do chicks, but remain quiet for possibly 24 hours. They then burst the shell, but must be left quietly alone, as they are a little delicate for the first few hours.

Burford's "Magic" Egg Preserver.

The Safest, Cheapest, and Most Convenient Form of Preserver.

THOUSANDS OF POUNDS WORTH OF EGGS

Preserved with

BURFORD'S "Magic" Egg Preserver.

King Roup.

The disease known to pultry keepers as roup, and dreaded by them above all other poultry diseases, is a malady insidious in its approach, difficult to handle when observed, and fatal in the majority of instances. It may also be said that, owing to the potency of the disease, a fowl once attacked by roup in a severe form is practically useless ever after. That a disease having so many qualities detrimental to the health and well-being of poultry should occasion much uneasiness in the minds of those who have the care of birds is not to be wondered at. Roup, therefore, takes first place in the list of diseases to be avoided.

Avoiding disease is more than half the battle in keeping poultry with success. Curing fowls is an uncertain and tedious process in most complaints to which birds are liable, and Roup is the worst of all. The disease may break out again and again when apparently it has disappeared. Also the germ may have been left behind, to come into existence on the first favourable opportunity.

It may be said that roup is a dirt disease, flourishing most in insanitary surroundings.

A primary cause for an outbreak of roup is a changeable temperature, such, for instance, as a cold snap following on hot weather. Or the house may be draughty, and colds arise therefrom. A cold is a premonitory symptom of roup unless promptly treated and cured.

Where roup is suspected the owner should go amongst his birds at night. If sneezing, coughing, or a rattling noise in the throat is heard roup is either present or on the way to the fowls. Later, if observed, a watery mucus will be noticeable in the eyes, nostrils, or mouth and throat of the bird attacked. Later this mucus will thicken, get yellow, and the breath of the fowl will become fetid. Emaciation rapidly follows. Then roup is present, and the difficulty will be to get rid of it.

In all bad cases the bird attacked by roup should be promptly killed. Roup becomes embedded in the system, and may break out in various forms. Further, it is not advisable to breed from those fowls which have had roup. The progeny are usually weaklings, besides seeming to be predisposed to the disease.

There is a variation of the disease known as diptheritic roup. Then, in addition to the ordinary complaint, the discharge thickens to a cheesy consistency, and becomes attached to the skin of the mouth and throat. Such cases are really not worth saving. The birds should be killed, and the bodies burnt.

There is no certain mode of curing roup, yet many cases yield to reasonable treatment. In the first place, isolate all infected birds. Treat them with half a teaspoonful of salad oil once a day, giving each bird a roup pill twice a day. Sponge frequently and thoroughly the eyes, nostrils, mouth, and throat with a disinfectant, diluted sufficiently to prevent injury. In feeding, give bread and milk, boiled rice with milk, a little meat (raw and well cut up), and anything the bird will eat, except grain. The birds may have milk or fresh water to drink. Whatever the liquid may be, as soon as the birds have stopped drinking, it will be advisable to take away the vessel, and cleanse it with lime or boiling water. Otherwise the germs that have fallen into the liquid will bear the contagion and help to distribute it.

In dealing with roup, cleanliness is the main thing, and what also is important is that the strength of the bird must be kept up.

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Poultry Notes.

A stale egg will sink in water.

Stale eggs are glassy and smooth in shell.

The boiled eggs which adhere to the shell are fresh laid.

Eggs packed in bran for a long time smell and taste musty.

After an egg has been laid a day or more, the shell comes off easily when boiled.

If an egg is clean and golden in appearance when held to the light it is good; if dark or spotted, it is bad.

A good school for the amateur is the show room, if he has a desire to learn; but the beginner who thinks he knows it all is a nuisance.

If you are looking for a "soft snap" stay out of the poultry business.

There is little wonder at the want of fertility in many instances when one comes to examine the yards, the stock, or the methods of the owner, stock must be kept scrupulously clean if they are to have vigor, and they must be well fed.

21 Poultry Papers for 1s.

THE AUSTRALIAN HEN AND FANCIERS' FRIEND is the generally acknowledged best Poultry & Fanciers' Paper in the Commonwealth. It is published twice a month and costs 5s. a year, post free. But to prove its value, we shall send you 12 back numbers—a liberal poultry education—post free, for 1s. Money back if you are not satisfied. Write to-day before they have all gone.

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WATCH IMPORTER.
BOWMAN'S ARCADE, ADELAIDE.

Sole Importer of the Famous Registered
"Sheppo" Brand Watches.

Silveroid Double-cased Keyless Chronometer Levers, £1 10/-. Open Face, £1 5/-. Sheppo Double-cased Keywinders, £1 5/-. Open Face, £1 1/-. Sheppo Watches are Lifetime Watches, no others so good.

G. L. MUELLER'S
Aromatic Schiedam Schnapps

G·L·M
TRADE MARK

This universal cordial is manufactured and bottled
IN SCHIEDAM (HOLLAND)
with special care and is warranted free from every injurious property and ingredient.

It is highly recommended by most of the hotelkeepers in the Commonwealth of Australasia.

Please take notice of the signature on the labels, and beware of inferior imitations.

Geo Louis Mueller

Contains 54 per cent. Proof Spirit.

Sore-Head or Chicken Pox.

Symptoms. Light colored specks, about the size of a pin head, appear on the comb or face. These specks grow rapidly into warts from one-eighth to one-quarter of an inch in diameter, and dark brown in color. There are two varieties of pox—the dry and the moist. The dry has been described; the moist affects the eye and fills it with a frothy, white substance, whilst sometimes the whole comb and head is covered with one immense sore. This is a severe form of pox, but yields rapidly to treatment.

Causes. The disease is caused by a fungus "Aspergillus fumigatus," the spores of which are always present in the atmosphere. This is the common white mold of bread, but it works serious havoc when it attacks any living organism. The disease is prevalent in damp, cold weather. It is exceedingly contagious, but when it appears in a flock there is no necessity for isolating the afflicted bird. The entire bunch is affected at once, and the birds that do not fall to the disease at once are not likely to take it later.

Treatment. Color the drinking water pink with permanganate of potash. The birds that have warts should be caught and the crust of each wart removed. The underneath tissue will bleed. Dip a clean feather in a bottle of pure creolin and just touch the raw tissue of each wart with the liquid. The next morning the treated wart has a black scab over it, which dries up and falls off in two or three days. At that time the underneath flesh has healed, and in a week one cannot detect where the wart had been. A white scurf appears on the comb and face. When the bird is recovering, this scurf should be rubbed off with a cloth moistened with vaseline. Remember, it is absolutely necessary to remove the crust of the wart and apply the remedy to the raw tissue underneath the crust; otherwise, the remedy cannot get at the root of the trouble and kill the fungus.

Where the head is a mass of sores, the treatment consists in painting the entire head with pure creolin three times a day. Do not try to remove the sores, but let them dry up and drop off of their own accord. This treatment will cure sorehead, even when the entire top of the head and both sides of the face are affected. We have personally proven it.—"Poultry."

Eggs! Eggs!

Sittings from Heavy Laying

White Leghorns
Black Leghorns
Black Orpingtons
Silver Wyandottes

15 Eggs to each setting. Guaranteed fertile or replaced. 10/6 per setting.

T. E. YELLAND,
S.A. Farmers' Co-Op. Union, Ltd

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Vigilance Necessary During the Summer.

There comes a time during midsummer when the chicks have got to putting on the feathers nicely, when the strain of watchfulness seems to relax, and the poultryman appears to feel that the need of special care is over. At this time the birds are allowed to look after themselves, and several evils are often the result before the effect is very noticeable. This is more especially found where t chicks are being confined to th own runways. It is also apparen where the freedom is given to a and the large and small are permitted to run together. The consequence is that the big ones overrun the late hatched, eating all the feed, as well as usurping all the favorable spots generally.

This running together tends to stunt the growth of the little fellows. It is a hard matter to get them to recover from such a set back and attain the size and development they would, had no check been received. This, of course, applies more to poultry in a confined space than to the flock that has the run of the farm. On the farm, the hen can take her brood to new territory every day. The farther afield she goes the better for her brood.

Pointing out the consequences should put the unwary on their guard, and they should see to it that advice is not needed, nor unheeded in their case.

Then another thing that is often overlooked, is the fact that the chicks are rapidly getting larger, and the coop that was roomy for them a month ago is now badly crowded.

A peep into the overcrowded coops on a warm night will show the chicks with outstretched necks, and wide awake eyes, gasping for air. The weaker ones are crowded down to the floor in a reeking atmosphere. Such crowding soon puts the weaker chicks in such a state that they look a month younger than their fellows of the same age. Some morning these stunted ones will be found trampled into a shapeless mass, a victim of overcrowding.

These chicks were all right, and if given roomy night quarters, would in all probability have reached a healthy maturity. Carelessness in attending to feed, pure water supply, shade, grit, etc., are other things that are often neglected in the midsummer season, and the effect quickly seen in the flock. Don't relax your vigilance now, it is too costly, neglecting the half grown chicks and then trying to build them up again.

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Chicken Diseases.

When the poultry fancier has his yards stocked with little chickens, and he discovers disease in any of its various forms, his first thought ought to be to find out the cause, and remove it. Chickens hatched by means of the hen are apt to suffer very much from the attack of lice and fleas. The former will be found on the head and neck, and can be got rid of by putting a little turpentine, or a weak solution of carbolic oil, on the place affected. The latter can be settled by means of a good dusting with insect powder. Chickens having lice on them will never thrive, but often hang on to a miserable existence for a week or so, ultimately getting weaker and weaker, until they finally die. Another chicken trouble is "gapes." How this disease or parasite is formed is not quite understood, except that it sometimes comes in the drinking water, in the form of eggs, when it is taken in by the chickens. The symptoms are violent coughing. One of the best cures is a powder, which is inhaled by the chickens, when the worms become dislodged and are coughed up. Diarrhoea is another disease which kills a lot of chickens. A little powdered chalk and a feed of rice will generally cure the subject, which will require careful feeding for the next few days. Consumption sometimes shows in a brood of chickens. Those attacked had better be killed, and the rest should have Parrish's chemical food in their drinking water.

Pigeon Notes.

Pedigree Breeding.

Every successful breeder of high-class stock knows well the importance of what our American cousins term "line-breeding"—that is, the systematic and careful selection and mating of representatives of any given race of animal or bird, with a view to obtaining and perpetuating certain characteristic features.

The breeding of fancy pigeons offers a very large scope for the development of skill and judgment in that direction, and the many facilities of which the modern amateur may, if he pleases, take advantage, make matters easy by comparison with the old order of things.

It would, for example, be almost impossible to overrate the good results brought about by the introduction of the now universally-used Conference ring, a contrivance simple enough in itself, but in the perfecting of which no small amount of time and labour has been expended.

Previous to its introduction breeders were in the habit of using numbered rings, made of brass, white metal, and other such materials, as a means of identifying their birds; but for many reasons the majority of these rings were, more or less, unsuitable, some being heavy and cumbersome, and others apt to become too easily detached from the leg. As years went by an increasing demand for a better and more durable ring became apparent, and the feeling among breeders on the subject culminated in the election of a representative body of influential fancers, who formed what is known as the Pigeon-marking Conference, and whose deliberations resulted in the issue of a recognised form of ring, which, as already observed, is now universally adopted by all the leading fanciers and show authorities. But the ring originally designed did not fulfil all that was required of it, as it was found that dishonest exhibitors were able to remove it from, and affix it to, the leg of the pigeon with comparative ease, thus defeating the end for which it was principally employed: viz., to act as a guarantee of the wearer's age.

For the information of those not familiar with the Conference ring, it should be stated that it is constructed on a metal formation, bearing the year of issue and pedigree number, and entirely encircled by enamel, varying in colour according to the variety to be "ringed." In the original ring the enamelling extended only partially round, thus offering temptation to fraud on the part of the unscrupulous exhibitor, who, unfortunately, as already stated, occasionally took advantage of the loophole to deceive the judge. With the ring now used, however, such practices are well-nigh impossible, although there have been isolated cases in which some doubt has existed as to the genuineness of the ring worn, in spite of the difficulties that tampering with the enamel would involve. The Conference ring answers a two-fold purpose. Firstly, it clearly establishes the year during which the wearer was bred; secondly, it acts as a valuable guide to the breeder in tracing the pedigrees of his stock.

With the majority of pigeons eight days is about the age at which the squabs should be "ringed"—that is, when there is a pair in the nest, and things are proceeding normally. Where there is only one youngster it is apt, on account of the extra nourishment received, to grow faster, and may be ready for the ring at the sixth or seventh day. On the other hand, delicate and weakly squabs are likely to "hang fire," and the breeder may have to delay ringing operations for a day or two. In any case, it is better to be too soon than too late, for so rapid is the growth of young pigeons at this age that even a day may suffice to render the passing of the ring over the ball of the foot a matter of great difficulty.

The operation of adjusting the ring to the squab's leg is a very simple one when once the knack has been acquired. By stretching out the three front toes, and gathering them together in line, the ring can be easily drawn over them, and brought up so as to encircle the broad part of the foot. The hind toe is then pulled back, and placed against the shank, which will allow of the ring being moved well up the leg; almost, in fact, to the hock. The hind toe can now be released, and will fall into its natural position, with the ring resting at the base of the leg, being prevented from falling off by the spread of the toes.

Under ordinary circumstances there is little likelihood of anything going amiss, but it is advisable to give an eye to the ring for a day or two after it has been placed on the squab, in case the latter's movements in the nest may have caused the ring to slide too far up the leg, and to embrace the elbow, which will consequently become stiffened, and cause lameness.

After the ring has been placed on the leg its number should be carefully noted in the stud book in the space provided for that purpose. It will by this means serve as a record for future reference. Such a system is almost indispensable where a large stud is kept, and its observance will place the breeder in possession of information of the utmost value when selecting his stock birds.

The various relationships which the birds bear to each other can be seen at a glance, and their respective merits—as indicated by marginal notes in the stud book—easily compared, without the necessity of handling the pigeons themselves. The fund of knowledge thus accumulated must, it will readily be admitted, place the breeder in an exceptionally advantageous position, and enable him to score heavily over others whose methods are less comprehensive.

The foundation of a strain may be an easy matter enough in itself, but its continuance and improvement through a series of years is, without careful attention to such details as the above, practically impossible. Indeed, it is not too much to say that it is only when the rudiments of pedigree-breeding, based upon a sound and reliable system of record keeping, have been thoroughly mastered and overcome, that the amateur can consider himself on the right road to becoming a breeder in the true sense of the word.—From "Pigeons."

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"Go it, Billy? Yer ain't arf licked yet!" cried an enthusiastic spectator of a street fight. "Well, you come and 'ave the other arf," said Billy. "I ain't greedy!"

WOODWARD & MEAD
PIGEON SPECIALISTS,
Have bred some sweet 1910 youngsters in
MAGPIES, JACOBINS, HOMERS, NUNS.
Prices to suit all purses.
G. J. MEAD,
"Chiltern," Sycamore Grove,
BALACLAVA, Victoria.

Pigeon Notes.

Mr. E. A. Grosser asks us to express his heartfelt thanks to his many pigeon fancier friends who have expressed their sympathy with him, in his recent sad loss.

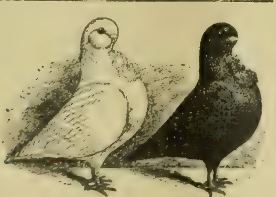
In this issue we print papers read by Messrs. W. B. Viney and C. W. Creer at recent meetings of the S.A. Canary & Pigeon Society. Both are by men who have had much practical experience in the matter of which they have written. We are obliged to them for kindly forwarding us copies.

There are still many people interested in pigeons, who though they do not exhibit, would find much interest and benefit by joining this progressive Society and attending the meetings which are held on the first Friday of each month.

At the next gathering, December 1, entries will close for the first young bird show which is to be held on the following Saturday, December 9. This young bird show is a new and very welcome addition to the work done by the Society. Similar shows will also be held during January and February, and it should be noted that the Society is giving a trophy for the exhibitor who scores the most points in any one class at the three shows. This idea is certainly a good one and will add considerably to the interest of these competitions.

Mr. E. A. Grosser writes us that he has recently purchased the blacksmith and wheelwright business at Hamilton till lately owned by Mr. J. Jose. Mr. Grosser adds that as he has worked in this shop for close on fifteen years, he is thoroughly at home and ready for any amount of business.

He also mentions that his stock of pigeons will probably have to be somewhat reduced. A good opportunity for some one, as this season's youngsters already on the wing include 20 C. F. Tumblers, 12 Turbits, 30 Blondinettes and Owls in addition to some sundries, Nuns, etc. Mr. Grosser speaks highly of the quality of some of them. Recent sales he informs us include Blondinettes to Mr. H. E. Chase and Turbits, Nuns, and Owls to Mr. W. B. Viney.



O.K. LOFTS.

This is where the Champions are bred. At 1911 Sydney Royal we won 2 Champions, 6 Firsts, 3 Seconds, 2 Thirds with 11 entries only. At S.A. Pigeon and Canary Show we won the "Blondinette" Cup, the "African Owl" Cup, against 15 others also the "Short face Tumbler" Cup for best young tumbler, all with home bred birds, also a number of Specials, Firsts, Seconds, and Thirds. To give amateurs a start I have for sale Blondinettes, African Owls, Short face Tumblers, Nuns, Turbits, etc., from 5/- each. Fifty to clear before breeding season. Apply at once to—

E. A. GROSSER.

Hamilton, S.A.

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What is a Champion?

Rambler writes :—"I was most interested in Mr. C. Wilkinson's letter in last "G. & F." re Mr. E. A. Grosser's Champion Almond Tumbler. Well, I should just like to ask Mr. Wilkinson how he judges S. F. Tumblers. Will he please tell me and other pigeon men who will be interested. I may not know a cow from a connundrum, but I do know that by the English standard, though your bird Mr. Wilkinson beat Mr. Grosser's in body colour, Mr. Grosser's beat yours in the matter of size, head, beak, beak setting, wattle, and in spangling for it is a fact, though the judge seemed to overlook it, that every feather should be broken. I need only say that if the birds had been handled by an English Tumbler judge, Mr. Grosser's bird would have beaten his opponent. May I suggest that Mr. Wilkinson sends his Tumbler cock to Sydney Royal next year to see if he can secure a Champion ticket like the one won for Mr. Grosser by his little Champion Almond Tumbler."

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The Carrier Pigeon.

Paper read by Mr. W. B. Viney at the October meeting of the Australian Canary and Pigeon Society.

Most writers finish with what I am about to start, i.e., the standard points of a breed :—

The head should be long, straight, narrow, uniform in width from back to front, flat at top with slight dent, the length from back of skull to tip of beak not less than 2¾ inches. Width ½inch measured at back of head and between eye wattle.

Beak.—The upper and lower mandible long, straight, thick and boxed, i.e., the upper should close on the lower like the lid of a box. Colour of beak in blacks and blues, flesh colour with stain or streaks of black. Duns, flesh colour with light stains. Whites, flesh colour,

Face.—Length measured from centre of eye to tip of beak, two inches.

Beak Wattle.—On upper mandible should be distinct from the eye wattle, soft in texture, broad, slightly curved, tilting forward from the forehead, and pointed at its termination towards the tip of beak, its outer surface resembling that of a cauliflower, the upper wattle being accompanied by a corresponding, but smaller one, on the lower mandible called the "jewing." The measurement around both wattles to be as large as possible.

Eye Wattle.—Large, circular, and rising slightly above skull. The ball of eye prominent. Its iris, fiery red in blacks and blues, and fleshy-pearl in duns, dark or bull eyed in whites.

Neck.—Long, thin, and graceful, well undercut at the junction of the lower jaw with the neck.

Back.—Straight and sloping; breast full and deep in keel; shoulders bold and muscular, wings strong, flights carried in a continuous line with the tail, which should be long, running in a sloping line with the back and carried clear of the ground.

Thigh and Legs.—Muscular and well stripped, supported by large and well spread toes.

Length.—From tip of beak to end of tail about 17½ inches.

Colour.—Blacks, a raven lustre. Duns, of various shades. Blues, sound, even and bright with well defined bars across the wing and tail. White and various coloured pieds.

Plumage.—The feathers dense and closely set.

This, as far as it goes, meets with my full approval, but I must confess to feeling capable of adding to the above. Of course the main point is and always will be, the beak wattles, which, in my opinion, should be judged sectionally, i.e., back, centre, rose, frontal, and wattle on lower mandible, and so with eye wattle (cere and inner lash of cere) commonly called eye

UNLEY PARK PRESERVED FRUITS & JAMS

(CHAS. TERRY, Manufacturer).

Made from locally grown fruit of best selected quality.
Every tin guaranteed. Pure and unadulterated.

Storekeepers supplied direct from the FACTORY, UNLEY PARK, or from R. F. DEANS, distributing Agent, Waymouth Street, Adelaide.

IT WILL PAY FRUIT GROWERS TO TRY UNLEY PARK WHEN SELLING.

lash, the lash when open to appear diamond shaped owing to the formation of inner cere. Yet another great point is that the beak must on no account be down face, the best outlook is that of a carrier that carries beak with tip slightly tilted in the air. Almost as bad as the down-faced bird is the one with a gullet showing. I will now run over a few of the external points which go to easily make good the carrier's claim to that proud title, "The King of Pigeons" and their value.

— Head Properties. — ...

Beak.—Length 2, straightness 2, stoutness 2, shape 2, colour, 2; total, 10 points.

Wattle.—Frontal fullness 1, serrations 1, texture 1; total, 3.

Rose.—Fullness 1, filling 1, texture 1; total 3.

Centre.—Fullness 1, circumference 1, texture 1; total 3.

Back.—Fullness 1, tilting 1, texture 1; total 3.

Jew.—Shape 1, fitting, 1, texture 1, total 3.

Head formation, setting of beak, 5.

Top Skull.—Flatness, 1.

Eye Pupil.—Prominence 1.

Iris.—Colour, 5.

Lash.—Formation, 5.

Cere.—Texture 1, lacing 1, thinness 1, proportion 1, shape 1.

Back Skull.—Narrowness, 1.

Cheeks.—Flatness to sides, 1.

Ear.—Smallness, 1.

— Body. —

Neck. — Thinness 2, length 1, reach 1, gracefulness 1.

Wing Butts.—Stoutness 2, carriage 3.

Back.—Slope 2, wedge shape 2, flatness 1.

Secondary Flights.—Hardness 1, colour 1.

Rump. — Free from bumps 1, colour 1.

Flights.—Length 1, tightness 1, colour 1.

Tail.—Proportion 1, colour 1.

Vent.—Free from fluff 1, closeness 1.

Feet.—Size 1, setting 1.

Claws and Toe Nails. — Claws grasping 1, nails, strong 1.

Shanks.—Length 2, stoutness 1, carriage 1.

Thighs.—Length 2, setting 2, hardness 1.

Keel.—Depth 2, straightness 1.

Breast.—Width 2, fullness 1.

Throat and Gullet.—Cut out 2, formation 2, smallness 1.

Total—Head, 50; body, 50; grand total, 100.

I should like to add that as to width of skull it was recently thought best to breed more for the wedge shape skull, as such birds as a rule carry better wattle but later this idea has been dropped and the narrow parallel skull is again bred for, it should be about ½-inch wide between eye wattles.

A boxed beak should be just as near as possible to a half circle at tip.

Old time peg top wattle birds are still grand stock birds when mated to a good bird of walnut typed wattle. The old fashioned wattle is a sure sign of true carrier breeding.

In young carriers look for those with good wide gape, a narrow one will never be able to carry much wattle correctly.

Finally, never show a Carrier which is out of condition, for the grand finish to even the best carrier is its type, and when not fit it cannot in truth approach the standard no matter how good its qualities.

◆

The Dragoon.

Mr. Creer's paper paper on the Dragoon is held over till next issue.

◆

What is a Champion?

Dear Sir,—In reply to Mr. Wilkinson first of all, two questions: Who has bred the most champions? and Is it not far better for the fancier himself to breed a champion than to send to England and buy such a bird? I claim that I have bred more winning birds in my lofts than any half a dozen other fanciers about here. I will show Friend Wilkinson a surprise when I get to the next show—several youngsters bred from the late champion Almond Tumbler cock—and the last of all, an Almond, is the best I have bred for years. Next year if I have any luck and good health. I shall take a trip to England and take with me six tumblers, viz., two Reds, two Agates, one Almond, one Kite, all of my own breeding, and enter at the Dairy and Crystal Palace shows. So now Mr. Wilkinson will you also send along several of the champions you have bred, or do you prefer to buy them, personally I like to breed them. I had my mind nearly made up to sell out all my Shortfaced Tumblers, but Mr. Wilkinson's letter in "G. & F." last month put new longing in me to breed some champions of this lovely variety. I intend to exhibit about 20 Shortfaced Tumblers at next S.A. show, so look out to see not only one champion, but several. I wish my Shortfaced Tumbler friend every success in buying his champions.—Yours, etc.,

E. A. GROSSER.

(Mr. Grosser appears to us to be hitting a bit wide of the mark also a little below the belt, however, we will leave a reply to Mr. Wilkinson if he should care to forward one.—Ed.)

◆

Housewives who wish to procure a thoroughly wholesome article should ask for Terry's Unley Park preserved fruits and jams. The name of "Terry" has been for many years honourably associated with the jam and preserved fruit trade in South Australia, and, in addition to the local trade, which is steadily growing, an extensive business is now done in inter-state and export. The jams and preserved fruits are all manufactured with the greatest care, the best fruit is carefully selected, and absolute cleanliness is insisted upon by the management.

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£2 CASH.

Goods are carefully packed and delivered at the Adelaide Railway Station.
If you want them put on board boat at Port Adelaide, add 1/- EXTRA.

Bag best White Sugar, 1A, 66 lbs., at one penny lb.	0	5	6
1 Fan, five leaves, Safety Pins, assorted sizes	0	0	1
2 tins Fruit in Syrup	0	0	6
1 metal box Linen Buttons, fourfold...	0	0	1
2 large bars Angel's Brand Soap	0	0	5
2 2-lb. tins Jam	0	0	6
1 lb. best White Starch	0	0	4
2 lbs. Japan Rice	0	0	4
1 lb. best Candles	0	0	4
1 lb. Currants, best colonial ...	0	0	3
1 lb. Raisins, best colonial ...	0	0	3
1 packet Borax, refined	0	0	1
1 card Bachelors' Buttons, fixed in a second, without sewing ...	0	0	1
1 metallic box best White Pins, ½-lb. size	0	0	1
1 4-oz. box Hairpins, assorted shapes, colors, and sizes ...	0	0	1
1 tin Fresh Herrings	0	0	3
1 tin Kippered Herrings ...	0	0	3
20-lb. tin, gross weight, our 2/- Tea, reduced to buyers of this parcel for	1	10	0
3 lbs. Dried Plums for	0	0	4
1-lb. tin best Baking Powder ...	0	0	3
	£2	0	0

SPECIAL LINES.

WINES—Choice Vintages, a dozen varieties to choose from, 1/3 bottle; 5/6 gallon.
Ale and Stout, 7/6 doz; Aerated Waters, 4/-; Tonic Ales, 4/6 doz.; English Ale, quarts, 13/9; Guinness' Stout, quarts, 13/9; Brandy. 23/- gallon; Dry Gin, 20/-; Whisky, 22/-; Rum, 20/-; Old Tom Gin, 20/-
Assorted Jams, 4 doz. in case, 22/6. Assorted Fruits, 3 doz. in case, 22/6.
Seasonable fresh Fruits and Vegetables supplied.

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286 & 288 Rundle St., Adelaide.
Cut this Slip out and send with Order.

How to Wash Summer Dresses, etc.

It is a thousand pities, when, through carelessness or ignorance, pretty summer muslins or silks are spoilt by bad washing.

Nothing, if one can afford the outlay in cost, is much more serviceable or easily washed than a white China silk blouse or dress, but most people ruin them in washing by putting them through such a process as to turn the silk yellow after two or three washings.

Soap should never be rubbed on to any delicate material, especially silk. Never allow a garment made of any very fine material, to become so soiled, that it will require to be rubbed on a board or with the knuckles; soaking and rubbing between the hands should be all that is necessary.

Takes two bowls; in one make some suds of hot water, Castile soap and a pinch of borax, then pour in cold water till the suds are just warm. Have the second bowl full of clear cold water. Now allow the blouse or whatever silk garment you are washing to soak for a little while in the suds, then rub it between the hands, adding a little soap-suds if the water does not lather properly and rinse thoroughly in the bowl of cold water.

Fill up the first bowl with a fresh lot of soap-suds and repeat the process only this time rinse in several cold waters, so as to be quite sure that all the soap is washed out.

To many this may seem a very elaborate way of washing, but the results are so very satisfactory in preserving delicate colours and keeping white silk from turning yellow, that it is well worth trying. Never wring silks or fine materials, but gently press out the water, give the garment a good shaking, and if of silk hang in the shade for a little while so that some of the moisture may evaporate. While still quite damp roll tightly in a dry cloth, put on one side for about twenty minutes, then iron it at once with a piece of thin muslin between the iron and the silk. Silk skirts, blouses and handkerchiefs ironed in this way have the same body to them, one can hardly call it stiffness, as those made of new material.

A skirt and a sleeve board are of great assistance in ironing, the cost is small and they can be had in several sizes. This board should be covered with two or three folds of heavy canton flannel tightly stretched and tacked or sewn underneath then over that a piece of fine cotton, which should be taken off every now and again to be washed, ironed and then replaced.

All delicate shades and mixtures of white grounds with coloured designs, are apt to fade or run when first consigned to the wash tub, so they should never have very hot or very cold water thrown on them, but they should be put into warm soap suds, to which a handful of salt has been added.

Whenever it is possible iron things on the wrong side especially laces and embroideries. These require to be ironed on a thick ironing blanket, for this helps to throw out the pattern.

Keep irons clean by rubbing on brick-dust or salt, have a special iron for blouse sleeves, also a very narrow one for lace frills and insertions.

Few people seem to know that it is possible to wash corsets and to wash them successfully, too. Make some good strong soap suds to which a little ammonia has been added.

Soak the corsets for a little while in warm water so as to get them thoroughly wet then spread them on a table and scrub well with a small brush and the soap suds. Rinse at once in clear warm water. Now place on a board pinning here and there so as to keep them well stretched and put them in the sun to dry. Do not remove the steels nor attempt to iron them as the figure will smooth out all wrinkles as soon as they are worn again.

One of the best curtain stretchers in the world is a clean grass plot. After carefully washing and starching them spread them on the grass, pinning down with non-rust hairpins. Choose a day when there is a good hot sun and the curtain will be dry and look like new in about a half an hour.

Remember also when doing up curtains to first shake out all loose dust, then soak them for a whole day in cold water, changing it several times. Make some strong soap suds in the usual way and douse the curtains up and down in it, also kneading them in the water with the knuckles. Change the water several times finally rinsing them in two or three clear waters.

If curtains are required to be stiff use hot starch, but most people, nowadays, prefer the soft finish of the new ones.

◆

"Doctor," said a patient, "what shall I take to remove the redness of my nose?" "Take nothing, particularly between meals!" the doctor answered.

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Preserving Fruits.

The following essay on preserving fruits for winter use appeared in the "Garden," and is intended more particularly for the benefit of householders. The instructions given are as applicable here as in the British Isles.

The author, a lady, Mrs. Ether F. Hallum, starts by saying that it is impossible to have good results from poor materials, and without those things which are equally necessary, viz., care and personal supervision.

In preserving fruit, whole or cut, it should be gathered fresh and clean, not rain-sodden, bruised, or too ripe, by which is meant that it should not be quite so ripe as it usually is when placed on the table, but sufficiently ripe for the essential flavour to have developed. It should be very carefully handled in the process; each fruit should be carefully wiped with a dry cloth. The sugar used should be of the best preserving quality; never use brown sugar.

The utensils used are enamelled or copper preserving pans, wooden spoons, and air tight jars or bottles, the best pattern being those of glass as wide in the neck as at the base, with glass tops fitting upon rubber bands, and secured by strong wire clips. A gas stove is preferable to the ordinary cooking range or open grate, as the temperature can be more easily regulated without shifting pans, and the inconvenience of standing for some time close to a fire in summer is obviated.

The methods of preserving may be classified under two heads—the first, in which the juice is the main property, such as raspberries, currants (white or red), young rhubarb, mulberries, etc.; the second to include those fruits which do not, through the action of heat, produce sufficient juice to form an adequate syrup, such as apricots, peaches, plums, pears, gooseberries, and black currants. Those under the first heading are best cooked in the bottles or jars in which they are to be stored; those under the second should be bottled after having been cooked.

The method employed for fruits under the first heading is as follows:—Take the necessary number of bottles, and, after wiping with a dry cloth, hold them one by one inverted over a lighted sulphur wick for a few seconds, so that the fumes of the sulphur may rise into the bottle, which should then be placed, still inverted, on a table so that the sulphur fumes do not escape. This last is important. Repeat with each bottle until all are so prepared. Then take one bottle and turn it mouth upwards, immediately filling it with fruit. Add sifted sugar in the proportion of a quarter of a pound to each quart of fruit (the sugar will work down among the fruit), and cover quickly, but do not secure the cover by its clips. Repeat until all the bottles are filled with the fruit.

To carry out the preserving process, place the bottles in a sufficiently deep and large saucepan, on the bottom of which a layer of hay or straw has been placed, to prevent the bottoms of the bottles from touching the bottom of the pan; also put some hay or straw between the bottles to prevent their knocking against each other. Pour cold water into the pan until it is about two inches from the top of the bottles, then set it on the fire and let it boil until the fruit in the bottles is reduced by about one quarter in bulk. Remove the pan from the fire without disarranging the bottles. As soon as they are cool enough to handle, one or two bottles, according to quantity, may be taken out of the pan, and the fruit from these bottles used to fill up the bottles remaining in the pan, after which these latter should not be removed from the pan until quite cold. Now burn a sulphur wick for a few seconds in the mouth of each bottle, holding the lid over the mouth to retain the fumes, withdraw the sulphur wick, and close quickly down. The best way to use sulphur wick is to hold a small piece with a pair of scissors or tweezers.

For the fruits which come under the second heading it is necessary to provide a syrup. To make this allow half a pound of sugar and a quarter of a pint of water to each pound of fruit. A little more sugar may be used if it is desired to have the preserves very sweet, but much sugar lessens the flavour of the fruit. Put the sugar and water into a preserving pan, let it boil for 10 minutes, removing all scum as it rises. Now put in the fruit very carefully, and let the whole simmer gently. Do not stir it, but turn very carefully once or twice so that all the fruit may be evenly cooked. When the fruit becomes tender enough to pierce easily with a knitting needle (which will be in about ten or fifteen minutes, according to the size and kind of fruit), remove the pan from the fire and leave it to cool. If the fruit has been stoned, a portion of the kernels, having been previously blanched, may now be added. Put the pan back on the fire and bring slowly to boiling point, let it simmer for ten minutes, and have ready the jars or bottles, which should have been dried and sulphured as previously described. Put in the fruit carefully while hot, with a wooden ladle. When the bottle is two-thirds full of fruit, fill up with the hot syrup; then close down after having burnt sulphur wick in the mouth of the bottle. Pears should but cut in halves or quarters, peeled, and the cores removed. Apricots should be peeled and stoned. Peaches should be halved or quartered. Allow 1½lb. of raw fruit for each quart jar or bottle.

The value of burning sulphur wick or sulphur paper is not generally known, the usual idea being that equal parts by weight of fruit and sugar must be used to make the fruit keep well; but the quantity of sugar is immaterial so long as the sulphuring of the jars is properly carried out. The sulphur fumes destroy the oxygen of the air in the mouth of the jar at the moment of closing, and this precludes the formation of mould; it does not communicate any flavour whatever to the fruit. As to the use of sulphur wick or paper, obtainable from any druggist, no doubt many readers will be sceptical; but the essayist has never known any preserves treated as above described to turn bad or lose their fruity flavour. They come out from the jars or bottles as fresh as when they were put in.

◆

"What's the matter with that child now?" asked a mother angrily. "They're playing at husband and wife," explained one of her hopefuls, "and George won't let her go through his pockets!"

K. BECHTEL,

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LADY IN ATTENDANCE.

Home Hints

FURNITURE POLISH.

Equal parts of vinegar, linseed oil, and methylated spirit, and half the quantity of turpentine, well shaken, to be applied, after the furniture has been washed with vinegar and water, with a piece of flannel and polished with two soft dusters. A brilliant surface will be the result.

TO KEEP LETTUCE FRESH.

To those who are not so fortunate as to grow their own lettuce it becomes somewhat of a problem how to keep it fresh from meal to meal. When left in water, even if the water be changed frequently, the leaves become shrivelled or slimy. The best way is to make a bunch of all that is not being used for the first meal, and merely put the ends in water. Treated in this way lettuce will keep fresh for hours, or even for two or three days.

TO GET RID OF BLUE-BOTTLE FLIES.

Paint windows of larder, etc., with oil of sassafras (to be procured at chemist's). Leave the windows open. The result is magical. A simpler and more convenient remedy is to cut a large onion in pieces and rub the shelves and windows with them. Saucers of quassia chips mixed with sugar and water are also a splendid deterrent to their presence.

SLEEPLESSNESS.

For sleeplessness try a light supper, and a walk afterwards. Sleep in a cool room, dark and quiet. Do not read or excite the mind before bedtime, and if you wake early get up and go out, and thus you will feel healthily tired by night.

INDIGESTION.

Take little butcher meat, and live on fish, milk puddings, tripe, and the like. Rest after meals, attend to the bowels, and take the following :—Carbonate of bismuth, 2 drachms, bicarbonate of soda, 1½ drachms ; syrup of tolu, 1oz. ; and peppermint water up to 6oz. A dessertspoonful in a little water half an hour before meals.

REMEDY FOR MOTHS.

The best thing to keep silverfish, moths, etc., out of drawers where clothing is kept, and from books, is a product known as naphthaline, which can be obtained from any chemist. It is a substance resembling paraffin wax, and has a peculiar smell, which appears to be greatly disliked by moths, fleas, and other objectionable insects. Where the fish attack the paper on the walls of the house, sprinkling the following mixture on the wallpaper will drive the insects away :—Take an ounce of camphor and cayenne pepper, and 8oz. alcohol. Macerate for several days ; then filter through blotting paper.

CLEANSING GILT FRAMES.

Gilt frames may be cleaned by washing them with a small sponge, wet with hot spirits of wine or oil of turpentine. It should not be too wet, but just sufficient to take off the dirt and fly marks. The frames should not be afterwards wiped, but left to dry of themselves. Sometimes all that is necessary is to rub the frames over with a sponge dipped in lukewarm water. Flies may be kept off the frames afterwards by means of onion juice. Cut a large onion into small pieces and boil them in small quantity of water till all the strength is extracted. Apply the juice to the frames on a sponge.

TO BOTTLE FRUIT.

Two pounds of sugar, two pints of water, twelve pounds of peaches, apricots or any fruit. Put the sugar and water into a good-sized enamel or preserving pan, and bring to the boil ; skim well, and let it simmer for 10 minutes. To prepare the fruit, peel the peaches, etc., which should be firm and not quite ripe, cut in half and remove the stones. Other fruit, such as plums, gooseberries, etc., should have their stalks removed, and be wiped carefully. When the syrup has boiled for 10 minutes put in the fruit. This will cool the syrup for some moments, but it must be brought to boiling point again and the syrup allowed to boil up two or three times through the fruit until they begin to show signs of slightly softening, but they must not be allowed to become soft or cook. Take out the fruit and fill into glass screw-top bottles. Then another relay of fruit may be put into the same syrup, and cooked similarly. Too much fruit must not be put in at once, for fear of breaking. Fill the bottles and then pour in the syrup up to the neck. Screw down at once, or else cork and seal.

SAVELOYS.

Saveloys are made of salt pork, fat and lean mixed, and chopped with a fourth part of bread crumbs, a liberal quantity of finely-minced sage, a little pepper, and some allspice. The mixture may be put into skins, but is quite as good rolled into shape. If in skins, the saveloys are boiled very slowly and eaten cold; otherwise, they are fried or baked, and may be eaten either hot or cold.

◆

Mr. A. G. Toyne, saddle and harness maker, late of 20 Franklin Street, desires to notify that he has removed to the corner of Pulteney and Flinders Streets, Adelaide, where he respectfully solicits a continuance of the patronage so liberally extended to him in the past. Country orders receive his personal attention and repairs are made a specialty.

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Editorial Notices.

TO ADVERTISERS.—Alteration of advertisements should be in our hands not later than the 15th of the month.

SUBSCRIPTION.—Posted to any part of Australasia 5/- per year, in advance. Foreign, 6/.

ADDRESS—85, Currie St., Adelaide. Telephone, 1234.

AGENTS.—Messrs. ATKINSON & CO. and MESSRS. GORDON & GOTCH, Ltd.

The Editor will be pleased to receive correspondence and answer questions. These replies will, for the most part, be sent by mail, unless received just prior to date of publication.

PUBLISHING DATE.—On the 25th of each month preceding title date.

DISCONTINUANCES.—Responsible subscribers will continue to receive this journal until we are notified by letter to discontinue, when all arrears must be paid.

Garden Notes.

Beginners, when told to stop a plant or to pinch it, are often puzzled to know what it means. It simply means when a young plant is growing freely to take out the terminal bud of each shoot, so as to cause other shoots to break out lower. Any plant growing freely may be treated in this way to make it bushy and increase the number of its flower-heads or spikes. It is not considered good practice to stop or pinch a plant when repotting, but wait till the roots have beome active or pinch a fortnight or so before. Pricking off or "pricking out,:' as it is termed, is generally applied to young seedling plants, and means transplanting from the seed-pots or boxes to others at wider intervals to give strength and increase the number of the roots. Another form of the same term is "potting off," which is done when the little plants are taken from cutting-pots or seed-boxes and placed singly in small pots to give them an independent existence.

In the phraseology of the potting shed, giving a plant a shift means transferring it to another pot usually of a larger size. In the growth of a plant from a seed or cutting there will be a series of shifts, the pots gradually increasing in size to meet the needs of the plant. Thus in the case of a Chrysanthemum — say, for instance— we may start the cutting in what is termed a "thumb" pot, and in about four shifts it will finish its career in an 8-in. or 9-in. pot.

— Staking Plants. —

Nothing detracts from the appearance of a flower border more than a number of thick ugly stakes showing conspicuously among the plants. Stakes must be used to a certain extent, yet there is no need why they should be obstrusive. For many plants that do not really need a strong stake yet must have some support, the thin twiggy ends of Pea-sticks suit splendidly. They give just sufficient support to the plants without making them stiff, and the plants hide the twiggy sticks almost completely. Most plants look far better when loosely trained than when bunched up to strong sticks, and the twiggy Pea-sticks may be used in this case with advantage. Whatever sticks or stakes are used (except twiggy sticks), they thould be painted a soft sage green; then, even if they are not hidden by the plants, they are not nearly so obtrusive as if left in the rough.

— Delphinium Sulphureum. —

Blue is of course the colour almost invariably associated with the Delphinium. This variety is of special interest by reason of its charming pale yellow flowers which are freely produced in long racemes on a much-branched plant. Reaching a moderate height the stems are sparsely furnished with finely-divided leaves, most of which are produced in a tuft at the base. Seeds should be sown in autumn to produce flowering plants for the following season. The seedlings should be potted off singly in small pots as soon as they are large enough. In spring they will be ready to transfer to their flowering position which should be a warm and somewhat sheltered one. Thoroughly drained soil, rather light and rich, suits it very well. As the stems are very slender they are very apt to get broken by the wind, so that staking should be early attended to. D. sulphureum, which is also known by the name of D. Zalil, is found in Syria, Persia and Afghanistan, where the flowers are said to be used for dyeing silk. A good companion for this plant is the scarlet flowered variety D. Nudicaule.

Roses From "Eyes."

There may be growers who, as a matter of interest rather than of real utility, prefer to raise a stock of roses on their own roots from what are known as "eyes." This is a very easy and simple method, and quite a number may be raised from a com-comparatively small quantity of rose shoots. To propagate roses by "eyes" the growth should be removed in the form of a shield. If each leaf stem and the embyro eye in the axil be inserted in sandy soil, they will root with comparative ease. The leaf must be severed intact, and not be interfered with in any way. Insert these "eyes" in very sandy soil in pots or shallow pans, just bringing the shield with the "eye" thereon immediately underneath the surface soil, which, by the way, should be covered with coarse silver sand, and the soil pressed firmly round about them. If the soil be moistened with care the pots or pans may be placed under a hand-light or bell-glass or in a propagating frame where moist conditions may be made to prevail. In this case, too, the "eyes" must be shaded from the sun and the leaves sprinkled twice a day with clear water.

— Saxifraga. —

The Saxifraga family is one of the most useful of plants for rock or basket work. It also makes a nice little pot plant for the shadehouse and its handsome foliage and bright blooms look well in the out-door border. It is of course one of the minature plants, growing only a few inches high. S. Cymbalaria is yellow flowered. S. crassifolia is pink. S. umbrosa is better known as London Pride. There is also a double flowered type.

— Tritomas. —

Tritomas, commonly called Torch Lilies or Red-hot Poker plants, are natives of South Africa and Madagascar. Of strong bushy habit of growth with foliage of good substance and tall flower spikes in colors they are decidedly useful. A fair-sized specimen in full flower will attract attention even if placed amid the choicest collection of summer-flowering plants. A group of them, numerous enough to send up from 50 to 100 torch-like racemes of bright scarlet, orange, and yellow hue, borne on strong erect stalks from 2-4 feet high is bound to develop into a brilliant display. Tritomas are subjects for border planting and are highly useful plants when conspicuous mass - effects are desired. For the latter purpose the most advantageous position is to place them so that their radiant shades stand out in vivid contrast against a dark evergreen background. Tritonias grow readily from seed.

— Clianthus Puniceus. —

The Glory Pea, as it is called, is one of the neglected beauties of our gardens. Every one knows, many have grown, and still more have tried to grow Clianthus Dampieri with which the Glory Pea is sometimes confused. The latter is, however, a much more accommodating subject. Sturt's Pea is far more widely known, doubtless on account of its more gorgeous flowers, the dark purplish black spot so conspicuous on the standard's of the blooms adding much to its effectiveness; otherwise they are of equal showiness, the colouring of both being a brilliant scarlet. C.puniceus is of fairly robust habit and may be grown either in bush form or as a covering for a trellis up to five or six feet high. In growth and leafage it somewhat resembles the Swainsona, but is a little stronger and bigger in growth. Its peculiar parrot-bill shaped flowers are freely produced in bunches of many blooms. It is not fastidious as to soil but will do best in a nice friable loam. It is easily grown from seed which is best sown in autumn. Unlike the Sturt Pea it does not appear to have any objection to a reasonable amount of transplanting. Sow the seed singly an inch or two apart and when the plants are two or three inches high, transplant to box or bed three inches apart each way, from here they can be shifted to flowering positions when convenient. It can also be grown from cuttings. C. puniceus alba is, as the name indicates, a white flowered variety of the type. There is also a variety of the Sturt Pea in which white takes the place of the black markings in the type. It is said to be very handsome.

COONARIE WATERFALLS ON THE WEST COAST.

The Nemesias.

Of this charming class of annuals which are rapidly becoming popular, Nemesia Strumosa Suttonii is perhaps the best. It is a native of South Africa, and is easily raised from seed, which should be sown in autumn, the seedlings pricked off into boxes of good light soil as soon as large enough to handle, and planted out for early flowering. It is not fastidious as to soil, but a rather light, well-worked, and well-manured loam will give the best results. The flowers are of great brilliancy, and for bedding may be had in separate colours, but the most charming effect comes through planting fairly close and using the mixed colours. Although of so many different shades, they yet seem to thoroughly harmonise, and the colours, though bright, are not crude. In the dwarf varieties the colours are less brilliant than in the type, but are none the less beautiful, while he growth of the plant is much more compact, and is literally smothered with small flowers for months.

-- Blue Flowered Salvias. —

Colour descriptions are sometimes very loosely applied in plant descriptions, but Salvia patens, S. amabilis, and S. azurea grandiflora have flowers of true blue shades. There is not even a suggestion of purple in the flowers of S. patens when grown under favourable conditions. It is a strong rooted perennial but is commonly treated as an annual. The spikes of rich, deep blue flowers are very freely produced on stems generally about two feet high. In England this member of the Sage family is considered an indispensable border plant, where flowers of this colour are desired. With us it is not nearly as popular as the scarlet flowered salvias on account of its requiring a somewhat shaded position. It makes, however, a grand pot plant for the bush or shaded house. S. azurea grandiflora is a native of Mexico, and is not so susceptible to sun heat. It is one of the herbaceous perennials with a somewhat woody root stock. Like S. patens, however, it is usually treated as an annual. The colour in this variety is a very attractive shade of light clear blue. In S. amabilis the colour is described as a rich lavender blue. S. Nutans is not strictly a blue, being more of a purple tone. It is too late to sow salvias for this season's flowering, but cuttings of young growth will root very quickly on gentle heat and will make plants which may be carried over the winter.

—Senecio Clivorum.—

Senecio clivorum is vigorous hardy plant with bold handsome foliage and heads of bright orange-yellow flowers carried on strong stems. It is an admirable plant for the foreground of a distant shrubbery or in an open space between large trees it gives a splendid bit of color. It looks especially well in the midst of pines and other conifers for the rich yellow flowers show finely against the sombre surroundings. Senecio clivorum is very free flowering and a mass of plants in bloom is bound to attract attention even from a distance. Moreover the plants increase rapidly, soon developing into large clumps. They seed very freely also. Individual flower heads are four inches or so across. The brown disc in the centre of the orange yellow florets adds still further distinctness to the flower. It flowers throughout a long season.

— Cineraria. —

The stellata type of Cineraria, though not as well known as the large flowered, have much to recommend them. The large heads of bloom are carried on long stalks which rise well above the foliage and thus lend themselves readily to effective grouping. They have a wide range of colour, nearly every shade except black and yellow being found. Sow now in any good potting soil, say two parts sandy loam and one part leaf mould. Sow thinly and keep in a cool and shaded position. If grown in a frame or in a greenhouse, keep close to the glass or the plants are apt to become leggy.

— Galanthus Nivalis Flore Pleno. —

Many people prefer the double form of the common Snowdrop because the flowers are rather more durable than the single ones. The plant is also later in coming into bloom under natural conditions in the open garden. and thus continues after the single one has passed its flowering period.

The distinction from the single form in which the flowers hang with half closed bells, and the double one, is that in the double form, the short inner segments have been many times repeated or duplicated so that the flower is very full, thus causing the outer segments to remain fully expanded under all conditions of weather after they are fully developed. It is of the same easy cultivation as the single one, and may be used precisely for the same purposes, whether out of doors or in pots. It is quite a matter of taste whether the single or the double is most to be preferred, but so far as graceful habit is concerned, the single one is by far the prettier.

— Virginian Stock. —

This popular dwarf edging plant has little connection with the garden stock and none with Virginia, hence the origin of its name is rather a mystery. It should be sown thickly where it is to flower either in mixed colours, or if preferred in ribbons of distinct shades. White, yellow, carmine, and crimson flowered varieties are procurable. Sow at any time during autumn.

— Sparmania Africana. —

This is one of the beautiful garden plants which have come to us from South Africa. It is an evergreen growing up to 10 to 12 feet high. It blooms in winter, the white flowers being carried on the extremities of the latest formed shoots. Propagation can be effected by taking cuttings of the young shoots and inserting them round the edge of a fair sized pot, in any ordinary potting soil. If a slight bottom heat is available so much the better. The plants will soon root and may then be potted separately or planted out in a nursery bed.

— Lasiandra. —

The complete name of this somewhat uncommon shrub is Lasiandra macrantha grandiflora. It does its best to compensate for this rather cumbersome designation. It may be grown as a shrub or trained against a wall or trellis up to about six feet high. Its beautiful deep violet-purple flowers are very attractive and their value is increased as they come during the winter. It is a fairly thirsty subject during its period of active growth and old established plants respond to an occasional drenching with liquid manure. After flowering the growths should be shortened back. It is easily grown from cuttings of half-ripened wood.

— How to Grow Cyclamen. —

The cyclamen, though such a useful flower for the glass or shade house or the open garden during the winter months, since the plants last in bloom for so long a time—is, nevertheless, rarely well grown by amateurs and beginners, yet the cultivation is not difficult provided it is carefully carried out. Seed may be sown now in shallow earthenware garden pans, having crocks over the holes for drainage, and filled almost to the rim with finely-sifted soil, consisting of loam or turfy soil and leaf soil, sand being added freely. This soil mixture is pressed fairly firmly into the pans, although it is not made hard. It is then made perfectly smooth and level by means of a flat board. In order to keep the surface soil moist, and so assist regular germination after sowing scatter a little fibre over it. For preference we should place it in a cool greenhouse but a glass covered box will do almost as well if fairly shaded and the atmosphere kept a little moist. Seedlings come up very irregularly, some appearing long after the first comers. If sown very thinly as they should be, the young plants may be left in the seed boxes till they have made fair sized tubers. If they come up too thickly some, or all, may be pricked out into small sized pots or boxes and grown on. Growing cyclamen from seed requires some patience, for they are not likely to flower till the spring of the year following, that is when they are eighteen months old. They compensate for this, however, by lasting and improving for half a life time.

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Besides this informality, the beautiful contrast of form must be noted, for Nature almost invariably seems to associate those plants which, from difference in habit of growth, form of leaf or flower, help to show up characteristics in each which, were they growing alone, might easily pass unnoticed.

This lesson of Nature's ought to be applied in every garden, for the contrast of form is quite as important as the happy blending of colours.

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To Destroy Ant Hills on the Lawn.

Take a pointed wooden stake and pierce a few holes around the ant mounds down to the level of the lowest gallery. Into these holes, according to size and depth, pour an ounce or so of bisulphide of carbon, and immediately press a little clay over the surface of the holes to keep in the fumes. If necessary, repeat this operation within a week or two. Another method is to place a piece of well-wetted carpet or old blanket over the holes immediately after applying the bisulphide and let it stay there for ten minutes; then remove it, and with a lighted paper at the end of a stick, set fire to the gas, which will explode and kill almost every ant in the colony.—"Exchange."

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Potting Soils.

A correspondent to The Garden, writes :—"I often notice in reading gardening instructions that many substances are frequently mentioned as essential or, at least, desirable for the growth of pot plants, which may not be easily procurable by the novice, and it has occurred to me that we may well give a little thought to soil substitutes, i.e., substitutes that can be employed when the more orthodox or better suited ingredients are not forthcoming. Of course, it will be understood that the use of these substances is only advocated when the proper soil, leaf-mould, etc., are unobtainable, though some of them, are, to use the shopkeeper's phrase, "just as good."

— Substitutes for Loam. —

The easiest way to get a substitute for loam, or, in fact, for the whole of the potting ingredients, is to consult a good nurseryman, state to him plainly the facts of the case, and negotiate with him for a bushel or sack of compost. In this case I would counsel the purchase of two kinds of compost, one for flowering plants, the other for foliage subjects. Let me, however, advise readers to obtain the various ingredients and mix their own. composts. They will learn to take as much pleasure and feel as much pride in compounding the various soil concoctions as does a cook in the evolution of one of her chefs-d-oeuvre. Gardening without compost mixing is like photography without developing—like love without kisses. Instead, then, of consulting the nurseryman, cast round for substitutes nearer home. In my part of the country we can obtain an excellent loam substitute almost for the asking. This is the tufts of grass called tussocks, raised in the grass meadows by ants. These are cut off level with the ground by the farmer's men with stout hoes and generally left lying in a heap in the fields. When decayed they make an excellent potting compost, and one that is, undoubtedly, the richer for the deposit of formic acid left in the soil by the ants. Failing these tussocks, most dwellers in country, and even in suburban, districts, have the chance of acquiring road trimmings at a very moderate figure. By road trimmings I mean the portions of grass and soil removed in the autumn from the banks, ditches and greens by the roadside by the orderly men employed by the local authorities or county council. These trimmings often contain a goodly proportion of road grit, and also, when stored by the the roadside, horse manure, and form an admirable substitute for loam when rotted down. If all other sources fail, recourse must be had to the garden soil, and often this may be made into a not-to-be-despised compost. Its chief objection generally is its fineness, which causes it to lie too closely in the pot and impedes the free passage of water. The addition of dried and thoroughly-decayed horse manure, coarse sand, broken brick, or lime rubbish will counteract this want of porosity.

— Substitute for Leaf Mould. —

The most natural and the best of these is peat; it is, however, generally so much more expensive than leaf-mould or more difficult to obtain, it should only be used in case of necessity. The chief function of peat and leaf-mould is to build up the stem and leaves of plants, and no compost can be considered complete in which both are lacking. Decayed horse or stable manure, from which all traces of straw have vanished, is another splendid substitute for leaf-mould. It should be thoroughly dried in a warm place and then rubbed through a fine-meshed sieve. Thfs will reduce it almost to powder, in which state it may be used at the rate of one-sixth part to the bulk of compost. Only one other substitute need be mentioned, and that is rotten wood. When this is in a dry and powdery form it is an excellent plant food, and used at the rate of one part to four parts of compost gives good results.

— Substitutes for Peat. —

Although peat is a good substitute for leaf-mould, leaf-mould can scarcely be considered as a good substitute for peat. The latter is employed almost as much for its elastic moisture-holding properties as for its manurial ones. Leaf-mould, on the other hand, possesses none of the elasticity or springiness which makes peat so valuable for Ferns and what are known as hard-wooded plants, and is easily destroyed by water, whereas peat is practically indestructible as long as pure water only is brought into contact with it. All things considered, there is only one really satisfactory substitute for peat, and that is the fibrous part of good loam.

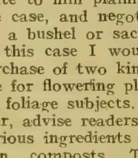
— Substitutes for Sand. —

Everybody knows what sand is, but for gardening purposes there is sand and sand. Two sorts of sand should be obtained whenever possible, both white, but one so coarse that it is possible to count the component grains; the other sufficiently fine to pass through a coarse pepper-sifter. The coarser sand is indispensable in promoting porosity and free drainage for water in the compost. The finer sand is employed to sprinkle on the surface soil of pots to prevent green, moss-like growth forming, and is also used in striking cuttings and sowing fine seeds. As sand has no fertilising or manurial properties whatever, but is used solely to promote porosity and drainage, it is obvious that any sharp, not easily caked, substance may displace it in the potting compost. Charcoal, broken into portions as large as peas, is the favourite substitute, followed by crushed mortar rubbish, broken soft brick, road grit, sweepings from gravel walks and sifted coal ashes. The latter three are cheap and generally easily obtainable, and answer quite as well as sand for potting large specimens or plants which grow quickly and only occupy their pots for a few months. Coal ashes, broken brick and lime rubbish should all be sufficiently fine to pass through a quarter-inch meshed sieve, and all should be kept dry.

◆

Fragrant Roses.

Reply to "H. P."—Half a dozen rich coloured (we presume you mean dark shades) sweet-scented Hybrid Perpetual Roses would be :—General Jacqueminot (red), A. K. Williams (crimson), Charles Lefevre (dark crimson), Senator Vaisse (rich red), Fisher Holmes (crimson), Louis Van Houtte (deep crimson), Ulrich Brunner (red).



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All seeds that rats, mice or birds esteem can be effectually protected by coating them with red lead. Place the seed in a vessel considerably larger than is needed to contain it—any old tin will answer the purpose—add to it a few drops of paraffin or water, just enough (not more) to moisten every seed, and stir it well; then add a small quantity of red lead and stir again until each seed is thoroughly coated and separate. A little practice is needed to apportion the exact amount of liquid and red lead. Vermin will sometimes attack seeds thus treated, but, disgusted with the result, soon pass on to other fare.

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The Rockery and How to Make It.

I have just been making a rockery, so I thought if I passed on my hints to other readers, they might prove useful, especially to those amateurs who, like myself, have recently removed to other premises. In this case there is often a lot of old rubbish lying about in the garden—old roots, weeds, cabbage stumps, ashes, clinkers, broken bricks, old pans and pails, bad soil. All this is difficult to dispose of without incurring expense, but may be put to good use in forming the foundation of a rockery. Old grass sods also may be utilised in this way where, as in my case, it was found necessary to take up a quantity of turf in order to cultivate the ground beneath. Let the sods lie in the sun, roots upward, for a few days to decay, then choose any ugly spot or corner in the garden for the rockery, or a bank or dry ditch, or where a wall is broken down, any of which may be converted from an eyesore into a spot of beauty.

Simply throw down into an irregular heap all the rubbish you can collect, leaving out the stones, as these will be required for the surface. Let any old pails or pots come near the top also, to form pockets in which to plant. Sods, roots, weeds, ashes, should be at the base, and any broken pipes placed on end and properly firmed. Do not make the heap uniform in appearance, the more irregular it is the better. Mix some garden soil with decayed manure and shovel this on, finally adding the stones placed on end, and some with points upwards. If any have a green or mossy side, this should be exposed to view, as it helps the artistic effect; and where possible, place two stones of different shape together to form a crevice. Any old tree stumps may also be stuck in, as they form excellent support for creeping plants. After all is fixed, a little more soil will be found necessary, after which the planting may be done.—"The Gardening World."

◆

A Rustic Garden.

To attain true artistic harmony the entire garden must be planned as a picture in a frame, with due regard to its surroundings—each bed in the garden must be considered as a separate picture, but with due regard to the ensemble. Each flower or shrub must be carefully selected on the same lines. Colours must be blended in some parts and contrasted in others, crudity being avoided, and glaring as well as washed-out colours shunned.

If a gorgeous garden is required, of course it may be attained, but, as a rule, it is best to seek after quiet brightness, which will always please, rather than an unnatural brilliancy, which soon tires even those who demand it in their gardens. The garden that is most natural in its art is possibly the most satisfactory. Curves are always to be sought after rather than straight lines.

A blending of styles is often more desirable than a rigid adherence to one particular style, yet if you want any special type of garden it is only right that you should closely adhere to it, rather than spoil it by introducing incongruities of any kind.

As in a picture so in a garden, we must adhere to one particular style, but its beauty may often be enhanced by a carefully introduced blend of something from another style.

Overcrowding is a glaring sin in many gardens; to be artistic we should avoid error in this direction. The individual specimens will thrive all the better for having plenty of air and for having plenty of room in which to display themselves to the best advantage.

A few varieties carefully selected with regard to height, form, colour, style, and the like are far preferable to a garden in which a little of everything is jumbled together anyhow. To keep the garden artistic all the year round is an ideal which we may easily realise by a little careful thought when planning it.

◆

Double Primroses.

Double Primroses are very easily managed when the conditions are favourable, for, in fact, they manage their own affairs perfectly. they are coy beauties, and one reason why you see them looking happy in gardens is that when they are unhappy they soon die. There are many varieties worth growing, and they are all beautiful, but the double white, double lilac and double red are worth a lot of trouble to ensure a free growth and a perfect bloom. They require a deep, moist, loamy soil, a partially-shaded situation, and to be often looked after, or they will not thrive. A dry soil is fatal to them. As remarked before, they require a deep, moist, loamy soil, but they will thrive in clay, sand, or peat. If in the first arrangement it is kept in mind that a free-rooting ground and constant moisture are essential, those who wish to grow these plants on poor sand or stubborn clay will find it a good plan to dig deep, break up the staple well and mix with it a liberal allowance of manure; the rest is easy. They must have food and like shade and moisture. The multiplication of the choicer sorts is by division. After flowering is the most suitable time for the operation, because there is a long-growing season before the plants to enable them to become established. But there is a great danger of the destruction of the stock when inexperienced cultivators divide their plants in summer, or they can be left until they become large, thriving clumps. In the meantime give them liberal supplies of water in dry weather, and, if the soil is known to be somewhat poor, weak liquid manure once a week all through the growing season is helpful.

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Thrips.

From "Horticulture."

Thrips are undoubtedly one of the most serious of the gardener's enemies. The following account of their appearance and habits is from "American Horticulture":—

Thrips are very small insects. All the species known to infest greenhouse plants are winged species, though at certain seasons many or even all the individuals may be wingless or else have only short wing pads. The wings are four in number, long and membranous. They are never folded. The hind margin is always and the fore margin generally, fringed with long slender hairs, in length greatly exceeding the breadth of the membranous part of the wing. The name of the order, Thysanoptera to which these insects belong, is derived from two Greek words meaning tassel-wing and one of the common names, Fringe Wings, is based on this peculiar wing structure.

The antennae are very slender, six to eight jointed structures. Besides the faceted eyes, two or three ocelli are present on the winged forms, even though the individual may not at the time possess wings. These ocelli are not present in the larval stage.

The feet are not terminated by a claw, but the tip is fitted with a protrusile bladder-like organ. This gives rise to the name Bfasenfusse or Bladder-feet and the scientific name Physopoda.

The mouth parts are intermediate in form between those of chewing and sucking insects but are believed to be used for sucking. Some of the parts which form a peculiar cone far back beneath the head are modified to a piercing organ with which the insect pierces the tender parts of plants and withdraws the sap. It is therefore impossible to kill thrips by spraying or dusting poisons on the plant, notwithstanding the opinion of some growers. Any benefit, if such there be, is due to other action of the material applied.

— Reproduction. —

Reproduction is oviparous, that is, multiplication by means of eggs. Repproduction is either bisexual or parthenogenetic. The latter method, i.e., reproduction without fertilization by the male, is thought by Dr. Hinds to be the usual means of reproduction in at least ten species and that it occurs in many others. He states further that the females almost always outnumber the males and that in some species males are found at certain seasons, in others the males are rare and in others unknown. The eggs of thrips, so far as they have been observed, are bean shaped and when fresh, clear white in color. In size they are very minute, those of wheat thrips being .009 x .003 of an inch.

The female thrip lays her eggs in the green parts of plants, first cutting a slit with her saw-like ovipositor, after which the egg is pushed down into the tissue below the epidermis. The operation has rarely been observed but so far as known requires only a minute and a half. The short time required for this operation, together with the fact that the insect, when possible, remains concealed, makes it difficult to discover where the insect lays its eggs. Again, it is impossible to know when the egg laying is about to begin. Sometimes the tissue is too hard and the insect is unable to withdraw the ovipositor, and the insect is kept a prisoner until relieved by death.

In the pupal stage the insect is quite inactive, changes color and usually retires to a quiet spot where it does not feed. During this stage the wings, the ovipositor and the genital organs develop. The insect emerges a fully developed adult. It is a noteworthy fact that the young thrips resemble the adult insects in general form, in structure of the mouth parts, and in food habits. They differ in lacking wings, in color, which is lighter than the mature insect, and in some of their activities.

Prof. Quaintance says that the life cycle of Thrips triciti is twelve days under summer conditions in Florida. The egg state lasts approximately three days, the larval stage five days, the nymph four days. In the north, especially in the high spring and autumn temperatures in greenhouses, no doubt the life cycle approaches or equals this. The same writer finds the life cycle of Onion thrips is approximately sixteen days, divided as follows:—Egg state three and a half days, larval stage seven to nine days, and pupal stage three days.

— Hibernation. —

The studies thus far made upon thrips indicate that they pass the winter in the same place where they have fed. Those feeding on leaves and flowers hibernate under the dead foliage and in the dried flowers. The grass-inhabiting species, among which are those doing the most damage to cut flowers, pass the winter in the turf. In such situations they can endure very low tempteratures without suffering injury as shown by the fact that they revive quickly when brought into warm quarters. They emerge very early in the spring and begin their activities as soon as the growth of their food plants starts.

Hibernating thrips can be destroyed by burning all dead grass, weeds, flowers, remains of vegetables, leaves, etc., in the vicinity of the greenhouses but to be effective this should be done early.

— The Effect of Temperature and Light on Thrips. —

The effect of temperature on thrips activity is shown by the well known fact that, like red spider, they cause most damage in the warmer parts of the house.

From the results of many observations it appears that thrips are not very active at temperatures below about 65 degrees F. On cloudy and rainy days when the temperature in carnation houses is more nearly that maintained at night (50-52 degrees) it has been found that thrips are rarely seen outside the buds. When the temperature rises above 60 F. thrips become more active and if the sunlight is not very intense they may be seen outside the buds in the majority of cases in the morning.

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Fashion in Flowers.

There are some, but not many, people of the world who affect to despise the influences of fashion, but in reality there are few who do so in entirety. They are more or less under its sway, and there are few indeed who do not feel themselves more or less affected by the vagaries of that mysterious influence whose origin is difficult to account for, and which seems to come and go in the most mysterious manner. It exists in flowers as well as in dress, and there are not many employed in the craft of gardening who can afford to dismiss fashion from his mind and follow his own special bent. To the professional, indeed, as a whole, fashion calls for his notice, and he must be prepared to follow it, to some extent at all events. The market grower and the nurseryman, as well as the florist, must pay heed to its changes, and be ever ready to meet the demands it calls upon him to supply. Should he fail in this, commercial disaster is certain to overtake him, although there are some nurserymen who, specialising in certain flowers, have a settled clientele, and who can for a time afford to ignore fashion's sway. Yet these must, although in a lesser degree, bow to the prevailing tastes in even their own special trade, so that it may be said with confidence that their prosperity depends upon some adhesion to either the special flowers or certain forms which attract the public taste for the time. The professional gardener, who is at the head of a private garden, is also much subjected to fashion's vagaries. In some places he may have an employer who gives no allegiance to fashion's reign, but these are few, especially where a lady's tastes have to be catered for, and the gardener is wise who is ever ready to provide whatever may be called for, and who does not obstinately set himself against anything new or popular at the time. Many good men and true have suffered shipwreck when in what seemed likely to be a long and successful career, simply because they scouted the idea of their employers, and refused to carry out, or placed obstacles in the way of, the wishes of those over them. Others, again, possibly less skilled in their craft, have gained favor, and have made their positions more assured simply by showing their readiness to carry out the desire of the employer who wished him to cultivate the flowers which were in fashion at the time. As with the market grower, the nurseryman or the florist, so with the gardener in the private place who does not conform to the fashion of the times. Should he have an employer who likes to have his or her place in keeping with the times, he cannot expect to retain his position in the ranks if he does not keep pace with the movements of the horticultural world. Even if some of these cannot be carried into practice on account of the tastes of his employers he can, at all events, show that he does not lag behind, and can reveal in many little ways that he is still abreast of the changes in gardening. Then, not only the employer, but those who come to see the garden, will discover that the gardener is a man of knowledge and of enterprise who is always ready to adapt himself to what changes fashion may call for, and always willing to carry into practice the wishes of his employers. Such an individual, provided that he is otherwise possessed of reasonable common sense and the other points which together go to the making of a good gardener, will be esteemed, and will be in a better position to retain his present appointment, or, if unhappily he should lose his post, will be more readily sought after by others. He need not neglect plants for which he has a special admiration, but most gardeners will be supplied with space sufficient for a little indulgence in hobbies of his own, and flowers, vegetables or fruits in which he specialises, without causing any deficiency in the produce most in demand at the time, and which is certain to be appreciated by all who see his place. Fashion may be fickle, but she is a dame of such power and influence that he who does not to some extent, at any rate, pay homage to her will fare worse than he who pays her due regard.—" A," in the London " Journal of Horticulture."

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Cape Cowslips.

All who have seen the Lachenalia when in bloom will remember that they are amongst the daintiest and sweetest flowers that bloom. They ought to be more generally grown, especially for pot work, for their cultivation is the very simplest. They hail from the Cape and all are perfectly hardy under any treatment. Three or four bulbs may be placed in a five-inch pot, giving good drainage and a moderately heavy soil. As soon as growth begins they should be given plenty of sunshine, for they are a sun-loving plant and are impatient of shade. When the flower spikes are developing, the size of the bloom and its lasting qualities will both be improved by giving weak doses of liquid manure. After flowering, if in pots, they should be laid on their sides in some dry place and will not require any further attention until the following autumn when they may be repotted and the same process repeated. Or if preferred the bulbs may, after ripening, be turned out and stored in dry sand. They are sometimes used for hanging baskets, for which purpose they are rather effective when planted somewhat thickly over the outer surface of the basket. For this work or for pot growing the bulbs should be only just covered. There are only two or three sorts commonly grown. Their height varies from 6 to 12 inches. Aurea and Tricolour are both charming little plants.

SCENES ON THE WEST COAST.

Sitting Room Gardening.

— Indoor Bulb Growing. —

With a little forethought and a careful selection of bulbs, we may have our rooms gaily decorated with beautiful fragrant flowers, some growing in glasses, others in lovely coloured bowls of various shapes which add greatly to the charm of the flowers.

The white Roman Hyacinths will fill the rooms with a delicate perfume, and the Paper White Narcissus will be in harmony with them. Snowdrops and Crocus will follow on. Then comes the Narcissus; such varieties as Golden Spur, Princeps, Emperor, Horsfieldii, Mrs. W. T. Ware, Chinese Sacred, and the double Daffodil have lovely flowers and are easily grown. Hyacinths with their stately spikes of flower make a grand display, and there is a great variety to choose from. The singles always give the best results for indoor gardening. Tulips come next, with very brilliant colours, they seem to adapt themselves to the sitting room; both double and single are easily grown. Ornamental bowls, pans and glasses can be purchased from most nurserymen where there is generally some beautiful patterns and shapes to choose from.

Drainage is essential for successful culture; bricks broken fine and charcoal form the best material. Place about an inch of this in the bottom, and cover with a thin layer of moss.

Several different opinions are prevalent as to what is the best material for growing the bulbs in. A great many use Sphagnum Moss, others prefer shingle; but after repeated trials I have had the best results from bricks broken very fine, also charcoal, well decayed leaf-mould and coarse sand, used in proportions thus: two parts of leaf-mould, one part broken brick and charcoal, and one part coarse sand. This forms a very porous and sweet compost, which is essential for this kind of gardening. When moss only is used it seems to get sour before the bulbs reach perfection, causing some of them to come blind. Shingle does not form a good rooting material, being much too hard and smooth also non-porous. It will be found on inspection that the rubble and charcoal have a quantity of rootlets clinging to them, but very few, if any, will be found on the shingle, although strong roots ramble between the pebbles.

Fill the bowls or pans about half full of the prepared soil; do not press it. Place the bulbs on this, and gently press them in. A good rule to observe in planting is to allow a quarter of an inch between the bulbs; nothing is gained by cramming them in. Fill up between them till level with the top of the bulbs, and gently press to make firm. Hyacinth glasses must be filled with pure rain water if possible, and the bulbs should not quite touch it. Leave, say, the width of a sheet of stout paper between.

— General Culture. —

Place all bowls and glasses away in a darkened position after they are filled. Let them stay there for five weeks, after which they may be gradually brought towards the light. Keep an eye on them at all times to see they do not get dry; when they are, give them tepid water. Hyacinths, Tulips, and Narcissus flowers will need a little support, very slight pieces of Bamboo being the best for this purpose.—"The Gardening World."

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Mulching.

Mulching plays an important part in the garden, as by its means many newly-planted or shallow-rooting subjects are preserved through the hot summer weather which might otherwise kill or seriously injure them. Mulching, however, often takes place at the wrong time, and though it may not do actual harm, yet it checks the plants by keeping the ground cold, instead of cool, around the roots. This happens when a mulch is applied too early in the season, before the sun has become powerful enough to warm the ground thoroughly.

When the ground has come thoroughly warm and the surface soil is beginning to get dry 1 inch or so down, it is time to mulch, and the plants will show the benefit of it in the course of a week or two. It is astonishing how cool and moist the ground can be kept with quite a thin layer of manure or other material, as practically anything, such as short grass from the lawn mower, decayed leaves, etc., can be utilised as a mulch. The only thing that a mulch should not do is to lie too close and hard, so as to prevent the proper aeration of the soil. The material used should be light and open, and yet possess sufficient weight to keep it from being blown away.

Mulching is quite a different operation to top-dressing, the latter being applied for the purpose of feeding old-established plants that have exhausted the soil around them and require feeding to bring them into good strong growth again. Top-dressing is best done in winter or early spring. There is no question that mulching is of the greatest benefit in hot summers, and the more it is practised the better. There is less need for watering.

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Tulips.

Most of the Tulips of our gardens are not natural species, but florists' varieties, and their origin is often very obscure. Many of them are derived from Tulipa gesneriana, but some of the earliest are said to be offspring of Tulipa suaveolens, an early-flowering scarlet Tulip which grows wild in the Crimea. Most Tulips, although there is one kind indigenous to the British Isles, are in their origin natives of Italy, South Europe, or Asia Minor or other parts of Asia. Tulips as a general rule like to be planted deep and in a light soil.

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Perennial Candytuft.

When grown in masses in the garden the common perennial Candytuft (Iberis sempervirens) is very effective. Half shrubby in character it thrives in any ordinany soil. It flowers in an exposed position as well, if not better, than in sheltered places. When not in flower the plants are not unattractive, being well furnished with dark green leaves. The plants grow and spread rapidly.

There are numerous positions in the garden where Candytuft may be used with very pleasing results. As an edging to shrubbery borders, growing on banks, or in groups in the flower borders, it is equally pleasing.

Propagation is carried out by cuttings and seeds, also by division of the plants. Sow the seeds in autumn in boxes or sow in the open ground. The best time for inserting the cuttings is a fortnight or three weeks after flowering. Make the cuttings about three inches in length and select a slightly shaded position. They may be dibbled in light sandy soil in boxes. Sprinkle the cuttings morning and evening if the weather is bright. The seedlings vary somewhat in habit of growth and flower. There are several varieties, perhaps the best known of which is Gibraltarica. The plants are somewhat compact in growth and have large handsome heads of pure lilac and white flowers.

◆

Hardy Auriculas.

These handsome plants frequently do not get the attention they deserve. They will thrive in most soils, and will do well on heavy ground if it is well drained. They are easily raised from seed, and a good stock can soon be obtained by this means. Seed should be sown in pans of light soil of a sandy, porous nature. Cover the seed slightly with fine soil, and place sheets of glass over the pans and upon these sheets of paper. The pans should be watered previous to sowing the seed. Some of the seed will be a long time germinating, and patience must be exercised. On germination taking place the seedlings should be exposed to light and water carefully afforded. As they increase in size they may be pricked off into pots or pans, and finally from these into boxes, from which they may be transferred to the open border when large enough. Sow from now on and during autumn.

◆

Husband—"How conceited you are, Effie! You're always looking at yourself in the glass." Wife—"I'm sure I'm not. I don't think I'm half as pretty as I really am!"

South Australia.

Income Tax Returns

are Due on ar before the 1st February, EXCEPT THOSE OF FARMERS only, which are due on or before the 1st May.

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FINES and INTEREST are imposed by Act upon Assessments of Late Returns, and no Remission can be made of same. Returns must be signed by the Taxpayer. No agent or attorney can sign Returns for principals resident in this State.

J. G. RUSSELL,
Commissioner of Taxes

January 1, 1912.

Petunias as Pot Plants.

To its wonderful beauty the Petunia adds agreatdegree of adaptability to many different conditions. It is as perfectly at home in the heated glass house as in the cooler shadehouse or the open garden. There are few things more decorative than a bed of well cared for Petunias which thrive and flower luxuriantly through our most trying weather. Being perennial plants with two sowing seasons it is possible so keep up an almost constant succession throughout the year. Petunia seed, with the exception of the more common sorts, is a little expensive, but no one who has grown a batch of the superbissima, grandiflora, or double flowered fimbriata strains, will ever grudge the extra shilling or two in first cost, which is repaid many times over in the wonderful succession of bloom almost unrivalled as it is for delicacy of texture and tint. The Petunia has perhaps one fault, and that is that the plant in itself is not handsome, but this may be largely overcome even when grown as a pot plant by neat staking and tying in, whilst the defect is quite hidden by the riotous profusion of bloom when thickly planted out of doors. As already mentioned Petunias may be sown pretty well all the year round. In any case the next few weeks will do admirably for making a beginning in Petunia growing. It may be admitted that raising the seed is sometimes a little difficult, it certainly requires more care than raising Balsam seed for instance. If the following directions are acted on the beginner may be assured that he will not go far wrobg and may depend on having a show of pot grown Petunias of which he will have no reason to be ashamed.

— Soil. —

It is well not to have any set rule in the quantities of soils to be used, such as two-thirds of one kind, a quarter of another, and so on. The principal thing is to get the body first, which should be composed chiefly of good virgin loam of a sandy nature, using some cow manure three to four years old, peat, plenty of sand, and some burnt ashes from a rubbish heap, the whole to be well mixed. Leafmould is preferable to peat, but is not always to be had.

— Seed Sowing. —

For this make the soil much lighter than used for potting. A seedpan or shallow box is best for sowing in; well drain it, fill to top with soil, make surface firm and smooth by pressing soil down with bottom of a pot, after which put pan or box in some vessel up to the brim in water to soak soil. Sow thinly, barely cover with soil, then put a pane of glass over top and keep in shade. When the seeds have germinated remove the glass by degrees, but do not allow the soil to get dry. If water is required, use a small syringe, because this does not allow the water to fall so heavily as to wash plants out of soil.

— Potting. —

In the first place the pots should be thoroughly clean. Dirty pots are very often the cause of plants becoming unhealthy. Good drainage is essential to this plant—in fact, it is half the battle in growing any plant. First place a piece of concave pot over the hole, then some rough pieces of pots or bricks, and a few smaller pieces of these, covering all with some lumps that usually fall to the bottom of potting soil. Over-potting is to be avoided in this and many other plants, as the soil is liable to become sour before the roots can come through the ball, so small shifts are best.

When the seedlings are fit to handle place them in two and a half inch pots, leaving the necks of plants clear of soil, which should be fairly dry. As soon as the roots are showing all round the ball shift into four-inch pots, potting moderately firm; but before doing this cut the point of the central shoot out to make them stool or throw side shoots, and this should be continued until they are in their flowering pots. By this means bushy plants are obtained. If under glass keep the plants well up to it, otherwise they are inclined to run leggy. Plenty of light and air is essential.

Pot again into five and six inch pots, which will be large enough for flowering in (unless large specimens are wanted). When in these pots the shoots should be staked out individually to form a well-shaped plant; the sticks to be thin, and kept out of sight as much as possible.

— Watering and Liquid Manure. —

Although the petunia can withstand great drought, it likes moisture during the summer months, also occasional supplies of liquid manure, more so when confined in pots. Small doses, and often, is better than too much at one time. The best and safest manure to make liquid from is fresh cowyard, but change of food is as beneficial to plants as to animals. Sulphate of ammonia is a good artificial manure, commencing from one quarter up to one teaspoonful to the gallon of water; but this must not be continued for any length of time, say, once a week for two or three weeks, then change to soot-water, cow manure, or Peruvian guano, which should be used in a dry state, putting a five or six inch potful to an ordinary barrow load of fine soil, and applying to the top of pots after takaing away a little of the top soil. Liquid manure is not required till the pots are filled with roots.

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Horticultural Wire Work.

The gardener needs horticultural accessories as much as he does tools; indeed the former are inseparable from the latter, for the mere tools for the tillage of the soil, and the cultivating of plants, are not enough in the twentieth century garden without artificial method of training plants in accordance with present-day ideas of a picturesque garden. In the olden times these were clipped in curious shapes, pyramids and quaintly shaped peacocks and other birds evolving from carefully cut box trees, and other old-fashioned plants. Nowadays the Rose grower, and the horticulturist who admires all climbing plants and creepers, noted alike for foliage and beautiful flowers, require wire trainers to guide their growth. Some beautiful shapes, such as umbrella, balloon, bell, and basket trainers have been devised. These metallic constructions are by no means costly, yet they produce charming effects. By the aid of machinery and skilful fingers ornamental flower stands and baskets are quickly made and are sold at reasonable prices. Then again the flower stands for window gardening may be reckoned a branch of horticultural supply. The selection of plants to place in them requires skill and tact. Then again there are strong galvanised arches and fancy fences, well worth the attention of buyers. Indeed the whole efforts of the gardener may be made doubly successful by the suitable introduction of horticultural wire work.

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Plants for Dry Places.

It very frequently happens in many gardens that there is a border or corner fully exposed to the rays of the sun nearly all day, with the result that the soil becomes so parched and dry that the owner is at his or her wit's end to know what to plant in it with any hope of success. Happily, Nature has provided many plants that will thrive in such a position, some are especially adapted for planting on rockeries that are notorious for their parched character during the summer months. Perhaps the most showy subject of all is the charming dwarf-growing annual Portulaca grandiflora. This delights in a sunny aspect, and, providing reasonably good soil is afforded, it will grow and flower with but little attention.

Campanulas.

It has been said that there is no position in the garden that one or other of the numerous varieties of the beautiful bell-flower will not make itself perfectly at home in. There is great variety of form in the group of plants, some being of tall pyramidal habit, whilst others are of the dwarfest possible type. Thus there are Bell-flowers for the back of the border, for a central bed, for edging, for rock or basket work, or for pot culture. There are amongst them annuals, biennials, and perennials, the majority belonging to the last-named class. They agree in one point, however, and that is that the range of colour is confined to various shades of blue and white. Perhaps the most popular section are the well known Canterbury Bells, of which there are several forms and colours, also doubles, and the beautiful cup and saucer Canterbury Bells. Campanula pyramidalis is the tallest and perhaps the most handsome of all, its popular name, the Chimney Campanula, indicates the character of this noble plant. S. persicifolia, siogle and double, in blue and white make handsome pot plants, about 15 inches high and literally covered with delicate bloom. For baskets, window boxes, bordering and rock edgings one may select from C. fragilis a beautiful blue flowered perennial plant; C. grandiflora, C. Carpathica, and C. garganica, also perennials, the latter of a delightful light blue shade, all of which are quite miniature plants which, however, retain the graceful habit of the stronger growing varieties. C. macrostyle and C. speculum which is doubtfully included in the group, are annuals, the former being one of the most beautiful of a very beautiful family. Campanulas are all easily raised from seed, which is best sown in late summer or early autumn, in well drained pots. If one has any choice of soil, one made up of equal parts of loam, leaf mould, and sand will be found quite satisfactory. If sown early the young plants, when they appear, will require shading from the hot sun. From the seed boxes they should be potted up singly as soon as large enough into 3-inch pots or else set out in nursery beds. If desired they can of course go straight to the position in which they are to flower. If to be grown and flowered in pots shift when necessary into five or six inch pots and afterwards into eight or nine inch size, in which the largest of the Bell-flowers will bloom abundantly. The dwarf sorts will do admirably in four inch pots. Like most plants when grown in pots they will be considerably helped by small doses of liquid manure. Cow manure steeped in water and the resulting liquid reduced till it is a light straw colour will be found as good as anything. An excellent soil for pot-grown Campanulas may be made up of three parts garden loam and one part each of old rotted manure and sharp gritty sand. It should be noted that the pots should be well crocked. If in the open border it will be found that the plants will benefit very greatly by being in a position in which they are shaded during some portion of the day.

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Primula Obconica.

Among the many species of Primulas it would be difficult to find one that is more generally useful as a pot plant for shadehouse or cool greenhouse than P. obconica, or the inversely cone-shaped Primula, the name being derived from the shape of the calyx. During recent years many fine varieties of it have been introduced, ranging in color from the palest lilac to a very good blue. The size of the flowers and the length of the stems have also been greatly improved by selection and good cultivation. Plants are easily raised from seeds sown during the autumn, using well-drained pans filled with finely-sifted soil composed of loam and leaf-soil in equal proportions, with a good sprinkling of silver sand added. Make this moderately firm, scatter the seeds thinly on the surface and just cover them with silver sand and sprinkle a little dried moss over it. Water very carefully through a fine rose, cover with sheets of glass and stand the pans in a warmish place. The glass must be removed as soon as the seedlings appear. When large enough prick off the seedlings into boxes or pans of similar soil. When several leaves have formed pot the plants singly into small pots, using soil composed of two parts good loam, one part well-decayed cow manure and one part leaf-soil, with a good dash of silver sand. Shift on as the plants require it until they are in 4½-inch or 6-inch pots. The plants are perennial and make fine subjects for a window. Gloves should always be worn when touching them as they are considered poisonous to some persons and on this account should not be placed where children can reach them.—" The Garden."

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Venus Looking Glass.

This hardy annual resembles in general appearance some of the Campanulas or Bellflowers; indeed, it is generally catalogued in that family under the name of C. Speculum. When the seed is sown in autumn, Venus Looking-glass is one of the earliest and showiest annuals to flower in early summer. Coming into bloom as they do after the spring flowering bulbs, and before the summer show is at its best, annuals such as this are worthy of more general cultivation. When once grown in a garden, if the ground is not disturbed beyond weeding and slightly forking over the surface, the plants seed and come up year after year, requiring no attention beyond thinning the seedlings if too thick. Grown in small groups near the front of the mixed border, or for massing along the edge of a shrubbery border, this is an ideal sdbject. The plants grow 9 inches to 1 foot high; the flowers are bell-shaped and violet blue in colour. The white variety, alba, is even prettier than the type for massing. The correct botanical name is Specularia Speculum.

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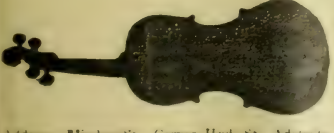

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Manuring the Apple.

A subscriber writing from Victoria, says, "I recently saw some reference to an American experiment which seemed to show that it was not profitable to apply fertilizers to an apple orchard. The experiment appears to have been carried out on a rather large scale and I have no doubt that many of your readers beside myself would be interested in any information you may have with respect to these experiments." Possibly the reference our correspondent mentions was based on the progress report of the experiment being conducted at the Geneva Experiment Station, N.Y., which was issued as Bulletin 339 under the title of "Is it necessary to Fertilizer an Apple Orchard?" a copy of which we received some few months ago. In this particular case the answer after fifteen years' test is briefly, No, thus confirming a somewhat similar, though less complete test carried out at the Woburn (Eng.) Fruit Farm by the Duke of Bedford and Mr. Pickering. It should not of course be concluded that because no apparent result was derived from the application of various manures at Geneva or Woburn the use of fertilizers would be equally ineffective at Diamond Creek or Balhannah. It is possible that some few orchardists in Australia use manure unnecessarily, undoubtedly the number who might do so with profit to themselves is far greater. It is true that no experiments in Australia have been conducted for so long a period as that under notice, but those interested will recall the various tests carried out by a number of growers some few years ago, under the auspices of the Potash Syndicate, in which it was shown that one or more apple orchards situated in several parts of the Commonwealth, responded very profitably to a system of complete manuring. Those responsible for the Bulletin before us are careful to point out that conclusions arrived at by them must not be accepted without question by tkose working under widely different conditions. In orchard manuring each grower should be a law unto himself and his own experimental station. He must, in fact, prove his own particular case before he can safely neglect a practice which has brought profit to thousands of his fellows. We quote freely from the recorded results of the Geneva test, which is interesting not only because of the importance of the subject, but because of the length of time over which it has been conducted and the very great thoroughness of detail and record. It may be said that as far as is humanly possible the factor of what is called "experimental error" has been eliminated.

— Summary. —

This bulletin is a report of a fifteen-year experiment to determine whether it is necessary to fertilize apple orchards.

The experiment under discussion was carried on in soil which is a clay loam too heavy for a good orchard soil. The orchard has been given the care it would have received in a commercial plantation.

There are twelve plats in the experiment. The fertilizers applied each year are as follows :-

— Plats 1 and 9. —

Mamure.	Weight per tree.
Stable	415 lbs.

— Plats 2 and 8. —

Acid Phosphate	12 lbs.

— Plats 6 and 10. —

Muriate of Potash ...	7 lbs.
Acid Phosphate	12 lbs.

— Plats 4 and 12. —

Muriate of Potash ...	7 lbs.
Acid Phosphate	12 lbs.
Nitrate of Soda ...	3 lbs.
Dried Blood	12 lbs.

An important consideration is that the fertilizers were put on only underneath the branches of the trees so that a tremendous excess of each has been used and the experiment, therefore, throws light on the question as to whether excessive fertilization is deleterious to trees. Is it not possible if not probable that this excess counteracted the good which might have resulted from a less extravagant use of manures.—Ed. G. F.)

The apple in the experiment is the Rome top-worked on Ben Davis, the Rome buds all having come from one tree and the stocks having been selected carefully. These precautions were taken to exclude individual variations. Cross-pollination is provided for, there being over a hundred other varieties separating and bounding the plats.

The results of the experiment are gauged by the yield, size, color, flavor, maturity and keeping quality of the fruit, the diameter of tree, amount, color and weight of foliage and the length and weight and the annual growth of the branches.

The fertilizers have had no sensible effects upon the yield of fruit in this experiment.

The size of the apples is possibly increased by the fertilizers since the percentage of culls and seconds is a trifle higher in the check plats.

The several current generalizations as to the effects of fertilizers on apples find no verification in this experiment.

All of the trees in the several plats have borne crops very uniform in maturity, keeping-quality, texture and flavor of apples.

A study of the table giving the diameter of the trees in the experiment shows no differences outside the range of variation in the several plats.

The foliage in the plats receiving nitrogen was greener than in other plats during the last season, the first difference to be certainly counted as an effect of a fertilizer.

There was also a measurable effect of the nitrogen in the weight of the leaves.

There is slight evidence that the trees on plats to which nitrogen is applied are making a greater annual growth of branches.

The trees in this experiment would have been practically as well off had not an ounce of fertilizer been applied to them.

An analysis of the soil before the experiment was begun shows that at that time there was, in the upper foot of soil, enough nitrogen per acre to last mature apple trees 183 years, of phosphoric acid, 295 years, of potash, 713 years. (Equal or greater stores of plant food are present in many Australian orchards, but the amount of total plant food so measured does not appear to affect the question of manuring.—Ed.)

It may be necessary to fertilize some apple orchards. Such cases will be found on sandy and gravelly soils, on lands very subject to drought, on very shallow soils and on soils quite devoid of humus. Some soils may require one of the chief elements of fertility; some, though few, indeed, need the three which usually constitute a complete fertilizer.

Having but little definite data as to fertilizer requirements for the apple, practically all the recommendations for fertilizing this fruit are based on the differences in the chemical composition of the apple tree and crop, as compared with truck and grain crops. But the chemical composition of a crop affords only a rough approximation of its fertilizer requirements, and the needs of the apple cannot be determined for actual practice by comparing its chemical composition with that of herbaceous crops. Its habit of growth differs greatly in many ways from that of annual crops—in age of fruiting, in length of growing season, in spread of roots, in character of the product removed, in amount of water transpired and in the continuous cropping of the apple without chance for rotation.

The problem in this experiment may be stated by amplifying a very little the question under which this bulletin is put out. Is it necessary to fertilize an apple orchard? Are the yield, color and quality of apples, and the vigor, health and longevity of the trees influenced by the addition of nitrogen, phosphorus and potash? The question is whether it is necessary to add these elements to a soil such as ours, under our conditions, rather than what combination of these elements should be used, or, what quantities can be applied without waste. So, too, time, method and frequency of application, important though they may be, do not enter into this experiment except as very secondary considerations. Our ignorance of the manurial requirements of apples is so profound that the necessity of fertilizing the average orchard is still debatable. It is, therefore, proper that an attempt be made to solve this part of the puzzle first.

The soil is a heavy clay loam from twelve to eighteen inches deep, resting on a still heavier and more compact clay subsoil; this in turn rests on shale which is to be found at a depth of from ten to twelve feet from the surface.

In such a soil the root room is limited—a fact we have had forced upon our attention in early spring when the soil is wet, by the blowing over of several trees. Manifestly, food would be better utilized by trees in a soil where the roots can develop better. Despite the physical condition of the soil, apple trees make a very fair growth and the fruit sets in abundance, but with most varieties, and the Rome, used in this experiment, is not a marked exception, the apples run small, fail to color well and do not always mature properly.

The orchard is divided into twelve plats, of five trees each, separated by single rows of trees not in the experiment. There are four fertilizer plats in duplicate in the experiment and four check plats. Unfortunately one of the twelve plats had to be discarded early in the experiment. The remaining eleven plats were very uniform in vigor and health when the orchard received its first coating of fertilizer.

— An Important Consideration. —

The plan of this experiment calls for certain amounts of nitrogen, phosphorus and potash per acre. Since the fertilizers have been put on only underneath the branches of the trees, a tremendous excess of each has been used. This experiment should throw light on the time-honored belief that excessive fertilization is deleterious to trees.

— The Trees: Variety, Propagation, Setting, Training. —

The apple in this experiment is Rome top-worked on Ben Davis. The choice as to variety fell to Rome because the trees bear at an early age; are exceptionally productive; the apples are red and any influence on the color is therefore readily detected.

Exceeding care was taken to obtain an orchard as free from individual variations in the trees as possible. To this end the Ben Davis stocks were selected as nearly alike as trees grow in height, caliper, mode of branching and character of root system. All came from the same nursery block in which they had been set as root-grafts three years previous. To further obviate variation, the buds for the trees in the experimental orchard came from a Rome tree of good growing and bearing habits in the Station variety orchard.

The trees in the orchard are amply cross-pollinated, though doubtfully necessary with the apple, the Rome especially, by the rows surrounding and separating the plats. The most ardent advocate of mixed planting for cross-pollination cannot find fault with the provisions for inter-pollination in this experiment.

— Care of the Orchard. —

The aim has been to give the trees in this experiment the same care they would have received in a commercial plantation.

RESULTS.

— Factors Considered. —

In gauging the value of fertilizers it is imperative that both fruit and tree be considered. Those we have chosen for this experiment are diameter of tree, color and weight of foliage, and the length and weight of the annual growth of the branches. All of these criteria taken separately are open to some objections—even when taken together it is impossible to draw wholly satisfactory deductions.

— Effects of Fertilizers on the Fruit. —

The orchard bore its first crop of fruit in 1902, when the trees were in their seventh year, and has borne six crops since. An examination of the figures for the eleven plats shows that the fertilizers have had no sensible effects upon the yield of fruit in this experiment; and the figures for the individual trees, emphasize this conclusion. If two or three seasons in this fifteen-year experiment be considered as a single period, advantages might be claimed for some one or another of the plats, but when a longer period, or the total, is considered, the advantage is in every case contradicted—incidentally these contrarieties show the necessity of a long-time experiment with fertilizers for apples.

— Size of apples is Possibly Increased by the Fertilizers. —

The percentage of seconds for the check plats was a trifle higher than the average and the percentage of culls higher than the maximum. The differences, however, are very slight and unless future crops show the same falling off in size for the checks, increased size must not be counted as an asset for the fertilizers in the experiment up to the present, but rather as an accidental variation.

— The Fertilizers exert no Influence on the Color of Fruit. —

The popular generalizations as to the effects of fertilizers on the color of fruits, as "potash paints fruits," and "manure makes green apples," find no verification in this experiment.

— Effects on Maturity, Keeping-Quality, Texture and Flavour of Apples. —

There is a general supposition that all the qualities named in the heading of this paragraph are more or less affected by fertilizers. Facts to bear out such a supposition usually arise as the vigor of the tree is influenced. The great uniformity in the product of all of the trees seems to point to the conclusion that the fertilizers have had trifling or no effects.

— Individuality of Trees. —

The advocates of individuated strains of fruits may find valuable

(Continued on page 352)

Fruit Stores.

By C. B. Luffmann.

A cool store room enables the orchardist to keep fruit far into the winter and thereby supply the local and inter-state markets when as a rule prices are extremely good, but it will scarcely pay to build a fruit store where the orchard is small or say less than five hundred bushels could be relied on each year.

The only fruits likely to pay for special storage are apples and pears. Late ripening fruit of firm texture and perfectly sound, especially about the eye and stalk, are the only kinds which should be selected for storing. The cooler and more regular the climate in which fruit is grown the better it will keep. Soil and the degree of exposure given to fruit during its various stages of growth have also a great deal to do with its keeping qualities.

The ordinary requirements of a fruit room are that it shall be proportionately long and narrow; have wide doors at each end and a high pitched roof; these features securing ample ventilation and an even temperature. Means should exist for admitting daylight to every part; but the light must be excluded when fruit is stored. Double walls secure the lowest natural temperature obtainable. The roofing should be as thick as possible and the eaves broad. Thatch or bark makes the coolest outer covering of the roof.

The building should where possible be placed on a well raised and solid platform so as to secure perfect drainage. The chamber floor should be composed of clean hay and sand, tamped hard and well graded, or laid over with concrete. Tar nor any other odorous material should never be used on the floor or any other part of the building. No paint is needed inside, fruit being highly susceptible and easily tainted where tar, paint or vegetable odours abound. The materials for building will always depend on the natural resources and demands of the district; and the means and tastes of the owner.

A high narrow barn-like building with deep verandah on three or all sides proves sufficiently cool for a store in late districts. Hot winds and direct sunlight from the north and west should be excluded by trees, or by selecting a site open only to the cool east and south.

Where fruit is to be stored for market it requires to be carefully selected, graded and cased so as to avoid the expense of further handling. This means that few or no fixtures are necessary in the commercial fruit store.

The choice and control of temperatures for various fruits and during different seasons can be decided only by experience. Certain it is that no one natural temperature will serve for all fruits or seasons, all depending on the water content; the degree of ripeness; humidity of the atmosphere; its temperature without the chamber; and the degree and quality of the light available.

Ripe fruit demands the lowest temperature and cleanest surrounding air, very little if any light and a comparatively dry atmosphere. On the other hand if green or undeveloped fruit is placed in a very low temperature it stagnates and so fails to develop into a marketable condition. Further, where fruit is decidedly watery the air should be fairly dry and frequently changed; but, if the fruit is close and hard and also on the green side, the house should be damp enough to prevent the escape of the natural moisture of the fruit, otherwise it will waste and shrivel.

A strong fruity and gas-like odour is a certain sign that the chamber needs ventilating. The cool period of the day is the best time at which to ventilate. Very dry rooms need a bucket or two of water standing on the floor to exhale moisture; very damp rooms need frequent ventilating and the burning of sulphur.

Where a chamber fails to preserve well selected fruit we may infer that there is something wrong in its construction, or, that the method of stacking and ventilating has not been well observed. Fruit storage without refrigerating plant is not practicable in hot districts, except under exceptionally favourable conditions and many growers find it more profitable to store in town depots. In Victoria there are a number of co-operative storage plants in various country districts. There should be scope in this direction in South Australia.

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London Pippin or Five-Crown Pippin.

Fruit, medium to large, 3 to 4 inches broad, and 2¾ to 3 inches high; roundish and somewhat flattened, with five prominent angles, which extend from the apex halfway down the apple. Skin green at first, becoming a rich golden yellow when fully ripe; it is sometimes flushed with red on the side next the sun, and then has a very beautiful appearance. Eye closed, set in small shallow basin; stalk short, inserted in a deep funnel-like cavity. Flesh yellowish white, crisp and juicy, with a very pleasant flavour. It is good either for dessert or cooking; in season from March till August.

It is good export apple, is a good grower and crops well, forming a large spreading head. It is a popular apple with growers. It is one of the oldest varieties of apples in cultivation in England; Hogg mentions a record of it as far back as 1580.

Applying Agricultural Lime.

— Crushed or Slaked. —

Crushed lime consists of quick lime, burnt lime, or lime shells, crushed into a fine powder after it has been burned in a lime kiln, and the advantages claimed for it, as compared with the same lime slaked in the field by water or by atmospheric moisture are that it can be much better distributed in the form of a fine powder, that it can thus be applied in much smaller quantity, that it is much more convenient to handle, and that it is applied in its most effective caustic form. Some of these advantages are undeniable.

Lime slaked in small heaps is not found to be in a very fine state of division, but consists in great part of sticky masses and lumps, which do not admit of being very uniformly spread over the soil, and which cannot be so intimately intermingled with its particles as is the powder of crushed lime. Neither is it found in practice that slaked lime can be distributed, even imperfectly, with any approach to completeness or uniformity unless it be applied in quantities of not less than about two tons per acre. In consequence of its moist and adhesive character it cannot be sown by any sowing machine, and spreading the heaps with shovels both necessitates the larger application and renders it at the same time less regular and equal. On the other hand crushed lime is sent out as a dry powder, which can be distributed very uniformly and easily over the soil in quantities of only a few cwts. per acre. The application of lime in the crushed form would therefore appear to be distinctly the preferable method, and so it would be were it not for the question of cost. Unfortunately the process of crushing the burnt lime is somewhat expensive, and crushed lime is commonly sold at prices nearly 50 per cent. higher than the uncrushed lime shells. A consideration of this objection to the use of crushed lime led to the institution of experiments by the West of Scotland Agricultural College.

The object of this experiment was to determine whether burnt lime could not be slaked in such a manner as to produce a dry and fine powder capable of being sown in small quantities by a manure sowing machine, and at less cost than that of the crushed lime. For this purpose a ton of lime shells was purchased and set in a heap in a corner of the experiment field, with convenient access to water. Water was at once brought to the heap and poured on it. The quantity of water required for the slaking was 20 gallons per ton of crushed lime. The heap was immedionce covered with a few inches of earth. About twelve hours later it was turned over, water was applied to all lumps that remained unslaked, the lime was then passed through a half-inch riddle to take out stones and unslakable lumps, and the slaked lime thus riddled was found to remain in the form of a very fine dry powder, which was sown without difficulty by a manure-sowing machine. In order to catch lime in the proper condition for sowing, the stones have to be separated by riddling not less than twelve nor more than 24 hours after the first watering; and after the stones have been separated by riddling, the lime must be sown without delay, or it will become sticky and incapable of being sown by machine. But, taken at the right time, the lime is found to be in the state of a very fine and dry powder, capable of the most uniform distribution in very small quantity.

The costs of the various operations, which were carefully calculated, were as follows:—

Cost of lime shells at kiln per ton 12/-; cost of slaking and covering with earth, 5d.; cost of turning heap and slaking remaining lumps, 5d.; cost of riddling through ½-in. riddle, 10d.; total cost per ton, 13/8; cost of crushed lime per ton at kiln, 18/.

Balance in favor of slaked lime per ton, 4/4.

It will be seen, therefore, that it is quite possible to slake lime in such a manner that it can be sown in quantities as small as crushed lime, and in a form capable of an equally uniform and complete distribution. The advantage in both respects is reported as being with the slaked lime, as the burnt lime in the process of slaking breaks up into a much finer powder than that produced by crushing, and it also swells into a bulk so much greater that much smaller quantities can be sown without difficulty by the machine. The only practical drawback is that the lime must be applied immediately after the slaking has been completed, and that accordingly large quantities cannot be slaked at the same time. This, however, can be regarded as a small difficulty as against the important fact that the slaked lime can be applied in the manner described at a cost per ton so much less than that of the crushed material. The superiority of the method of applying lime in the slaked form is therefore manifest.

—"The Leader."

How to Judge a Ripe Watermelon.

Most amateurs who have grown watermelons can tell almost by instinct when a fruit is ready to cut, though he may not be able to explain how he does know. Any one who is growing them for the first time should carefully watch the melons grow, and as they reach maturity he will notice that they assume a changed appearance a sort of transparent, look to which he will soon become accustomed. In the next place he must keep his eye on the tendril opposite the melon stalk. This tendril is rarely absent, and while the melon is growing it is green, but when the melon ripens it usually dries up, so that in most cases when a melon is seen with the mature appearance and the dry tendril one may be fairly sure that it is ready for gathering.

Having noted these points rap melon sharply with the knuckles and listen to the sound, then try an adjacent melon, known to be growing. There is a peculiar ring given by a ripe melon which is an almost sure guide when one has become accustomed to it, and this is test No. 3. Another point to remember is that when a fully ripe melon is lifted and a little pressure is put on the stem it will separate from the melon quite cleanly. This is an excellent test for many fruits as well as melons. When raising melons for market the grower must learn to distinguish the melon by these indications, and it will soon become an easy thing for him. The amateur, however, who is gathering for his own use, may make quite sure by kneeling over the melon, taking it in his hands, and pressing it as he holds it near his ear. A ripe melon so pressed will emit a brisk crackling noise, and for immediate use the melon will not suffer at all. If it be overripe this sound will not be produced.

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In the scientific point of view, every farm crop requires potash, while practical experience shows that the application of a potash manure in ordinary circumstances increases the yield and gives an enhanced profit.

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Continued from page 349)

material for buttressing their theories in the yields given for individual trees. There is food for thought as one notes the wide variations in the performance of individuals in the several plats of this experiment and remembers that all of the trees came from buds from a single tree. Can the yield performance of the best trees, as shown by the table, be transmitted to trees propagated from them? There has been no precise experimenting and but little precise thinking on the subject of individual strains of fruits now so much before fruitgrowers. The writer fears that the data given here, if used to substantiate any of the current theories, would but add to existing inexactness and indefiniteness. This experiment, while suggestive, does not warrant the conclusion that there are great differences in the disposition of trees in fruitfulness. Fruit-bearing is hardly an established habit of the orchard as yet and the trees have not recovered from top-working and over-pruning and the consequent upsetting of natural habits. The lack of uniformity in the yields of the trees in the several plats in this experiment is probably most largely due to outside influences. In all other characters these trees seem to be chips of the old block. Experimenters, fruit growers and nurserymen are not distinguishing sharply enough between what is due to ;' nature" and what is due to "nurture" in the "individuality," "tendency" or "character"—phrase it as you will, none are precise—of trees. This inexactness is leading to much fallacious endeavor in perpetuating fruits as "pedigreed stock."

— Diameter of Trees. —

Probably the best tree character by which to measure vigor, especially over a long series of years, is the diameter of the trunk. From a cross-section of a tree one can tell very accurately of the fat and lean seasons in its life by the thickness of the rings. The increase in the diameter of the trunk is thus in direct proportion to the vigor of the tree. Unfortunately it is somewhat difficult to secure a high degree of accuracy in applying this test of vigor. Tree trucks are by no means perfect cylinders, and in taking the diameters it is hard to decide where the measurement should be taken.

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In this experiment, after various preliminary trials, two measurements were made on each trunk from which an average was drawn. The diameter was taken one foot from the ground and again four feet above the ground. The summarized averages are shown and the measurements for individual trees. A critical study of the two table shows no differences outside the range of accidental variation. In the mind of the writer the evidence afforded by the tree trunks in this experiment is the clearest cut of any offered.

— Color of Foliage. —

As good a gauge to the vigor of a tree as any of the characters of the leaf, is the color. The leaves of a well-fed, healthy, vigorous tree are a dark rich green. With even a slight departure from good-feeding, health and vigor, the foliage takes on a lighter color varying toward yellow. To an experienced observer the color of the foliage in an orchard in which soil, variety, age, care and the great majority of conditions are the same, should find color of foliage as ready a test of the tree's condition as is the pulse or the temperature in animal life. Until 1910 the notes of this experiment record no differences in the color of the foliage in the different plats, but in the year named, especially after mid-season, there was a perceptibly greener tinge in the foliage of trees on plats to which nitrogen had been applied—the first difference to be counted as an effect of the fertilizers used in this experiment.

— Size of Leaves. —

The size of the leaves must of course be a valuable index to the condition of the tree. Differences here, however, cannot be detected accurately enough by the eye; there seems to be no feasible way of obtaining the leaf area either of individual leaves or the total area; and there are objections to measuring size by taking the weight. The last method, however, is the only one that could be devised for this experiment and leaf weights were therefore taken without noticeable differences.

— Leafing-time and Blooming-Time. —

The time of the life events under discussion often varies a few days when plants are subjected to different treatments. If the fertilizers were influencing the trees markedly differently in this experiment, it might be expected that there would be some differences in leafing-time and blooming-time. There have been none, however, contributory evidence to the inertness of the fertilizers so far as these trees are concerned.

— Annual Growth of Branches. —

The amount of new wood a tree makes in a season is an important criterion of the response of the tree to the treatment.

Here again we have evidence, slight though it be, that the trees on plats to which nitrogen is applied are making greatest growth.

We await with interest data to show whether this increased growth is to take place annually in the coming years.

(Since the above has been in type we have received a very valuable article giving the results of several years' experimental work in apple manuring carried out at Mr. R. E. Warren's Glenthorpe orchard at Harcourt, Victoria. This is bringing the question much nearer home. We need only say at present that the teaching is altogether at variance with the negative results in the experiment we have been been considering. We shall publish the article next month.—Ed.)

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The attention of our readers is drawn to the fact that the Income Tax returns are due on or before the 1st of February, except those of farmers only, which are due on or before the 1st May. Forms of returns are to be had at all post offices. Postages must be prepaid in every instance. Fines and interest are imposed by Act upon assessments of late returns, and no remission can be made of same. Returns must be signed by the taxpayer. No agent or attorney can sign returns for principals resident in this State.

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we are concerned because fruit, apparently sound and capable of keeping some time, is attacked prematurely, and soon decayed. The agents which cause rotting must be too prevalent, or through several extraneous causes, are allowed to begin their work too soon when such is the case. It lies in our power to prepare for possible attacks, and so protect the fruit.

In many instances, rotting is the result of the attacks of the common blue mould, well known as appearing on imperfectly sealed jam, bottled fruit, etc. It must be remembered that this mould fungus is a saprophyte, i.e., living vegetable organism. Fruit, up to the time it is full sized on the tree may be considered living, but once full-grown, it must be looked upon as dead material. The movement which may subsequently take place is among its self-contained properties, and there is no further connection whatever with the parent tree, even though it hang thereon until quite ripe. Ripeness in fruit is actually a step on the down grade towards the ultimate decay, by which natural means the seeds are set from their fruity enclosure. When the fruit has been supplied with all the materials the tree can give, it is mature and quite independent, though it may not yet be detached. At this point, all fruit should be harvested. It will ripen as well, and often better, in cases during transit to market, or in storerooms, if the conditions are equable, as it would hanging upon the tree. At this point, too, once the fruit is independent it is subject to the attacks of blue mould, and the tissue is destroyed by the roots of the fungus. The rot is capable of growth at all times of the year, provided there is sufficient encouragement, consequently all fruits are liable to attack. Some, like peaches and apricots, which are soft and tender of tissue, offer easier prey, and when set upon are more quickly destroyed, than firmer fleshed apples and pears. But, in all cases, the chief incentive for the attacks must be looked for in the actual surroundings in which the fruit is placed. A certain amount of moisture is necessary to germinate the rot spore. Apricots ripen early, usually in dry weather, but should there happen to be a shower of rain, the fruit may be badly attacked with rot. Fruit, if packed covered with dew, or placed in a damp situation, will develop similar results. Peaches during summer are not usually set upon, but some of the latest kinds ripening in March should the autumn rains be early, will quickly develop the roundish brown patches indicating rot. Again, early apples and pears may be free, while the later varieties, harvested after the cooler and more humid weather is come, will be subject to attack.

Among apples it is noticed that some varieties, notably Sturmer Pippin, Cleopatra, Ben Davis, and Reinette de Canada are very subject to rot, while others like Rome Beauty, Five Crown, and Stone Pippin seldom show it. The latter group is a firm-fleshed well-set type of apple, and better fitted to resist the attacks of mould than the former, which are loosely built. So also "spongy" fruit, such as is borne on young trees, is always more subject to rot than firm fruit.

The effect of the blue mould is, however, most felt in the storeroom. The first indication that the mould is at work is a small round spot of decay on the side of the fruit. It seldom happens that more than one spot appears, and this seems to point out that a weak place has been found in the skin. Perfectly sound and healthy skin can always resist the mould. There are generally weak spots where two fruits touch as they hang on the tree, or where a scratch is given by an adjacent twig or spur. Sometimes even a drop of dew lodging in the stalk cavity or the eye, will so soften the skin that the fungus can gain an entrance. A foothold, however, is most commonly gained where the skin is bruised or broken during harvesting. Decay spreads quickly from the central point of infection, and the whole fruit is soon rotten. Apples in the storeroom require to be overhauled a fortnight after harvesting, and all those showing the least sign of rot, removed, for if allowed to remain, the disease will spread to a number of other fruits, which otherwise could be kept sound. The infected fruit should never be allowed to lie until thoroughly rotten. It is found that even the roots of the fungus, which ramify the decaying tissue, are just as capable of propagating the disease as the spores which are produced later. Rotten fruit must be buried, with a quantity of fresh lime, in the manure pit or compost heap. If thrown to one side, a greenish coloured mould soon appears, and myriads of spores, representing seeds, are produced, to be blown about far and wide. If rotten fruit be left in the storeroom, what can be expected but that the fungus roots and spores will infect sound fruit or will lie about till next season, and be ready then to set upon fruit brought in apparently sound?

The mould then, plainly attacks fruit from outside, seeking to gain an entrance through the skin, where scratched, bruised, or otherwise injured. Occasionally rot starts in the centre of a fruit, and the portion around the core becomes decayed, while the outer part is yet whole. This, apparently quite a reversal of the usual method, is still the result of the blue mould, but the fungus spore has taken its prey in the rear, getting down into the centre of the fruit, where it found the tissue more exposed than on the outside. Many pears are liable to this mode of rotting, for they are so formed that they have an open centre communicating with a more or less open eye. Fruits so placed while on the tree, that moisture can trickle down into the centre, are sure to develop core rot. Again, peaches and apricots often decay from the centre outward, because when ripening the flesh comes away from the stone, leaving a cavity which the mould can set to work in. Peaches which split at the stone offer a still greater opportunity to the fungus.

Though the blue mould is common—more common, perhaps, than we take it to be—yet there are several other fungi ever present which cause rotting. However, for all practical purposes, the orchardist can consider them all alike, and requiring similar treatment. It is evident that these mould fungi are often on the fruit when it is harvested, though in a passive state. Fruit trees then must be sprayed with some mixture, which will check the disease in the open. The application of Bordeaux mixture, which should properly be given in late winter or spring for the purpose of combating the black scab and other diseases, will very effectually kill off the mould spore also.

To successfully cope with the rots inside, the storeroom must be kept scrupulously clean, no loose timber or rubbish of any kind that would harbour spores, must be allowed. All infected fruit must be removed and buried with lime, and on no account left in the storeroom to produce spores unchecked. Preparatory to receiving next year's crop, a thorough cleaning and whitewashing of all shelves and posts, and all nooks and corners, must be given. Then the damage by fruit rots will be reduced to a minimum.

Feeding the Orchard.

Extracts from "The Yeast of the Soil," a paper read by William H. Bowker before the Massachusetts Horticultural Society.

"The Yeast of the soil," as we shall consider it, is not plant food, but low orders of life which exist in the soil and but for which agricultural soils would be practically barren. "The yeast of the soil" is what is scientifically known as bacteria—organisms which thrive in the soil and by means of which, unavailable plant food, especially nitrogen in the form of organic matter, such as stable manure (leaves, stalks, etc.), is rendered available. The great discoveries of Hellreigel, the leading investigator along this line, demonstrate that higher orders of plant life are dependent upon lower orders of life. We could not profitably grow a corn or potato crop unless these organisms were growing at the same time in the soil, or had previously existed there and done their work.

In the spring of the year, when the weather conditions are usually unfavorable for the propagation and rapid multiplication of these soil "yeast plants," commercial manures are found of great assistance in forcing an early growth by supplying forms of plant food which have been rendered soluble by chemical treatment and are, so to speak, predigested, and ready for the crop to feed upon immediately. Since most of our cultivated crops make their chief growth in from sixty to ninety days, it will be clear that we must have plant food in the soil that will feed the plant from beginning to end, especially in the beginning of the season when the bacteria of the soil, owing to weather conditions, have not gotten under way.

In the majority of cases it is no doubt cheaper, if not better to apply stable manure in its crude state, directly to the soil, to cultivate it into the soil and allow the bacteria to attack it there; in short, to compost it in the soil rather than beforehand. In many cases it is desirable to use some thoroughly composted stable manure—manure which has been subjected to the bacterial process, broken down, and a considerable part of its crude plant food converted into available forms. This, however, was deemed more necessary years ago, before commercial manures were introduced. Now that concentrated available plant food can be bought, the necessity of composting manure in advance, is passing out. It is not only a slow process, but more or less wasteful and expensive, for in the process of nitrification through the bacterial action, a considerable amount of ammonia may be set free and wasted into the atmosphete. This always takes place when the compost pile is allowed to "fire fang," and turn white.

It is urged, however, by some experimenters that composting is desirable in order to raise the temperature of the manure pile to a point that will destroy the foul weed seeds, but is not this an expensive way to destroy weed seeds, as obviously it must expose the compost to loss of ammonia while also consuming time and labor? Except where a very find seed bed is desired, with considerable humus present, it is believed the compost heap will go out and commercial manures will be used in its place for forcing purposes.

In the matter of fine cultivation, the old theory of cultivation was to kill not only the weeds, but to make the soil light and friable, to admit the air, to encourage the circulation of moisture through the soil, and to make it an acceptable medium for the roots of the crop. The modern theory includes the old and also recognises the necessity of making the conditions as favorable as possible for the growth of bacteria. Thorough cultivation also conserves the moisture of the soil by means of a fine mulch on the surface, which prevents the moisture from evaporating.

Formerly the practice was to manure the soil in order to restore lost fertility and to supply, by guess work, deficiencies in the soil, as ascertained by a chemical or a crop analysis of the soil. This method is not now regarded as a practical solution of the problem, for neither chemical analysis nor the growing of crops can be relied upon as a true guide to its enrichment. The chemical analysis of the soil discloses too much that is misleading, and the growing, or even the matured crop, too little that is conclusive.

Modern practice teaches that it is not the soil, but the crop that we should first consider. In a word, we have turned from the soil, which cannot positively answer, full though it is of life, to the living crop which can; so today we feed the crop rather than the soil. In the modern sense, therefore, the grower is a manufacturer and the soil is his machine, into which he puts plant food and out of which, by the aid of nature, including the bacteria and other seen and unseen forces, combined with his own efforts, he takes his product at harvest time. If the soil machine is a good one, that is, of the right texture and retentive of plant food, full of active nitrifying bacteria or "yeast," so much the better. If it has a balance of crop-producing power to its credit, we seek to preseve that balance for an emergency, as the prudent man preserves a balance in the bank.

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The Use of Explosives in Preparing Land for Fruit Trees.

Mr. J. Wren, manager of Towrie Estate, Maryvale, has just prepared land for fruit trees, using gelignite for breaking up the subsoil. The position is a gravelly ridge, the soil being red volcanic, with a heavy clay subsoil. The surface soil was removed to a depth of about one foot, over an area four feet in diameter, in the position where the tree was to be planted. A hole was then jumped three feet deep with a bar, and five plugs of gelignite were placed in the hole and exploded.

On digging out a hole to see how deep and wide the soil had been disturbed, it was found that it had been lifted to a depth of 7 feet from the surface, and with a width of six feet. One man averaged six holes per day by this method; the cost for gelignite, fuse, caps, and man's wages being 2/- per hole. By the ordinary method of trenching, the work would have cost twice as much.

The rainfall in this particular locality is 20 inches per annum; so that, with the soil loosened to this depth, there is no liklihood of stagnant water lying in the hole. —Mark H. Reynolds, Agricultural Gazette, N.S.W.

Drink
COOPER'S
PURE BEER.

Orders to the Brewery,
Upper Kensington.

Inter-Pollination of Apples.

By W. J. Allen, Fruit Expert to the Department of Agriculture, N.S.W.

There is very little positive knowledge concerning the inter-pollination of fruits, and no subject in pomology is in greater need of study. We know that the most productive orchards are usually those of many varieties, and that some varieties refuse to fertilise themselves. The safest practice, therefore, is to plant only a few rows, say, three or four, of any one variety together, in fruits in which (like many apples and pears) sterility is often apparent. Bailey points out that self-sterility may be due to unisexual flowers, or to the pollen being impotent upon the pistils of the same flower, and that varieties may sometimes be self-fertile and at other times self-sterile.

Several orchardists at Mount Irvine, Blue Mountains, have been kind enough to furnish me with plans of their apple orchards, and notes upon the productivity of the trees, which are summarized as follows :—

Mr. C. P. Scrivener, in forwarding plan of his orchard, says :—

The trees are all planted in blocks, viz., 68 Sturmers; then four rows of Rome Beauties, 58 in all; then 68 Jonathans; then Five Crowns. The Sturmers and Jonathans flower at the same time, and the late Jonathan bloom is out when the Five Crowns come into bloom. The Rome Beauties bloom at about the same time as the Five Crowns.

The Sturmers nearest the Jonathans have always given the best crops, and each row has given lighter crops until the back row, which on an average has given about half the amount of fruit given by the row nearest the Jonathans.

The Jonathans nearest the Sturmers have also given heavy crops, gradually becoming lighter until those farthest away have only averaged about a case per tree. The heavy croppers give up to nine cases, and have averaged about four cases since starting to bear. The row nearest the Five Crowns crops practically only on the side next to Five Crowns, the other side of the tree being almost bare of fruit.

The Five Crowns nearest the Jonathans, and for three rows below them, give very regular crops, averaging about six cases per tree. The other trees give only about two cases per tree.

I think that if there were more bees here the difference in cross-fertilisation would probably not be so marked. The wind seems to be responsible for carrying the pollen, as the row of Jonathans near the Five Crowns is only fertilised on the side nearest them, whilst the Five Crowns seem to be affected three rows away. They are to the lee side of the Jonathans. In my orchard the soil is practically the same throughout.

In another orchard the Jonathans are the only trees planted in a block, and in this block there are 117 trees. There are also four trees mixed in with the main orchard. These four trees, although small, bear regular crops every year of about four cases per tree. The main block fruits heavily where the rows adjoin the other trees, gradually getting lighter until the outside row is reached, where the trees bear only about a case per tree. On the side nearest the other trees the block gives up to seven cases per tree, the average being five cases.

In another block, where Jonathan and Cleopatra trees are mixed, the trees are just coming into bearing, and gave an average last season of a little over two cases per tree.

There seems to be no difference in the amount of bloom on the trees bearing heavy crops and those only having a case of fruit. Naturally the trees that have had heavy crops have not grown quite as large as those with light crops.

Mr. H. B. Morley reports very similar results. He says :—

Five Crowns planted in block cropped only on the rows alongside the next variety, and the trees completely surrounded by other varieties, bore the heaviest and most regular crops.

The influence of the prevailing winds can be seen in the fact that the leeward side of the orchard bore regular crops. I have reworked a great many of my Five Crowns with Jonathan (and occasional trees of Cleopatra for cross-fertilisation purposes), but regret having done so, as I am sure that if occasional trees had been reworked, they would have cross-fertilised the main body of Five Crowns, which, from need of cross-fertilisation, had borne nothing previously. No doubt an overwhelming number of bees would help very much in cross-fertilisation.

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Summer Tillage.

Have you ever noticed that a brick wall built on moist ground is always more or less damp, and sometimes covered with a growth of fungi to a height which varies from a few inches to a few feet above the surface of the ground? The same thing happens on stakes driven into the ground, as well as on old trunks of dead trees, the moisture being sucked up from below by capillary attraction. It is also owing to capillary attraction that the oil in the lamps rises in the wick, and that little hair-like vaccine tubes for instance can be filled up with calf's lymph. Similarly, in a hard and set soil, moisture is drawn up from a depth of several feet, and precisely as the oil burns when lit on that end of the wick exposed to the air, so the water drawn up from below is evaporated when it reaches the surface layer of the soil exposed to the action of the sun and of the wind.

As fast as the oil burns in the wick more oil is drawn up from the lamp to replace it; as the water is evaporated on the surface, more water from below rises to replace it, and the hotter the sun, the more exposed the surface to the action of the wind, and the harder and more compact the soil the more active is the evaporation and, consequently, the drying-up of the soil, until it becomes as "dry as a brick."

By loosening and breaking up the crust of the soil the capillary attraction is for a time destroyed close to the surface, although water continues without sensible interruption to be drawn up all the same from the subsoil. As that water is not sucked up to the surface and evaporated by the sun and the wind it accumulates in the soil which feeds the growing crop, moistening it, keeping it cool, thus favoring nitrification of the soil, as well as root growth of plants.

It is essential, however, that the surface soil should not be broken up in coarse clods, but as well pulverised as possible, so as to prevent the too-free access of a drying wind to the soil beneath, through which water is continuously rising, owing to the action of capillarity.

A thorough cultivation of the soil is thus conducive to the retention of moisture in the soil in which the feeding roots grow freely in search of nourishment, which they can only absorb when presented in a liquid form.

Not only will a well-cultivated soil retain moisture in the gronnd, but it is also well calculated to catch the water which on a hard crust would run on the surface to a lower level, whilst on the other hand it has been demonstrated that it absorbs moisture on a cool night.

The cultivation of the ground answers moreover another object. It should be so regulated as not to reach and tear off the principal roots of the plant, but may be deeper in hot and dry localities than in wet districts, and the growth of surface roots should not be encouraged. In no case, however, need it go further than 6in.deep for the winter ploughing while in moist localities 4in. is quite deep enough. Summer cultivation is again more shallow.

TRY
HARDY'S
FAMOUS
WINES

◆

Eat Apples.

The apple contains a larger percentage of phosphorus than any other fruit or vegetable. This phosphorus is admirably adapted for renewing the essential nervous matter of the brain and spinal cord. The old Scandinavian traditions represent the apple as the food of the gods, who, when they felt themselves to be growing old, feeble, and infirm, resorted to this fruit for renewing their powers of mind and body.

The acids of the apple are also of signal use for men of sedentary habits whose livers are sluggish in action. These acids serve to eliminate from the body noxious matters, which, if retained, would make the brain heavy and dull or bring about jaundice or skin eruptions and other troubles. The ancient practice of taking apple sauce with roast pork, rich goose, and like dishes is based on scientific reasons. The malic acid of ripe apples either raw or cooked, will neutralise any excess of chalky matter engendered by eating too much meat.

Fresh fruit, such as the apple, the pear, and the plum, when taken ripe and without sugar diminish acidity in the stomach rather than promote it. Their vegetable salts and juices are converted into alkaline carbonates, which tend to counteract acidity. A good, ripe, raw apple is one of the easiest of vegetable substances for the stomach to deal with, the whole process of its digestion being completed in 85 minutes.

Besides these medicinal qualities of the apple, it has great virtue for local applications. The paring of an apple cut somewhat thick is an ancient remedy for inflamed eyes, being tied on at night when the patient goes to bed. In France a common remedy for inflamed eyes is an apple poultice, the apple being roasted and its pulp applied over the eyes without any intervening substance.

◆

Protecting Young Fruit Trees from Hares.

A correspondent to the N.S.W. Agricultural Gazette, writes:—

I have tried several methods but have never found anything equal to paper. Whitewash of any kind has to be renewed after every shower of rain, but by placing a piece of paper the length of the stem of the tree, wide enough to go round twice and tied lightly, top, bottom, and middle, you have a protection that will last the season.—W. E. Henderson, Singleton.

Vegetable Garden.

Vegetable Notes.

There is not a great deal to be done in the way of seed sowing this month which is, however, the one when the free use of the hoe, the hose, and the liquid manure can will pay a big dividend.

Sow seeds of cabbage, cauliflower, onions, celery, Brussels sprouts, but only do so in shaded seed beds, and if you are prepared to give them the attention they will require for the next few weeks. It is certainly less trouble, though not so interesting, to buy the ready grown seedlings in March.

Early sowings of carrots, parsnips, may be made. They will only succeed on well prepared beds. If it is one which is shaded from the worst of the afternoon sun so much the better. With these again it is waste of time putting in seed unless one is prepared to cultivate them, that is, by keeping the soil loose with the hoe, cool with a mulch, and moist with the hose. Dig the bed deeply but do not use fresh manure; but they should follow a crop which has been heavily manured, such as beans or potatoes.

Where they can be watered freely it is well worth while putting in a few rows of potatoes. Use nicely sprouted seed, plant more deeply than for spring work and if practicable, mulch the whole plot. Give the ground a good soaking a day or two before planting so that it will be free, moist and warm and will pack nicely around the tubers when they are set.

It is not too late to put in cuttings of sweet potato vine or rooted cuttings can be procured from most nurserymen. A bed of loose sandy soil is put to good use in growing this crop. Shade the plants with small boughs for a few days when first put out, and with this,as with other crops, a mulch over the bed will much simplify the matter of getting good results. If manure is not available use bracken, straw, etc., or if you live by the sea, seaweed will do excellently.

The difficulty of growing successful crops of beans, cucumbers, melons, tomatoes, in fact, any summer crops, is reduced fifty per cent, by the liberal use of any mulching material. What it is composed of matters very little comparatively, one can of course get pretty well the same result by keeping the surface soil stirred, say two inches deep, which is practically making this depth of the soil itself into a mulch, but the pleasures of hoeing are apt to pall if one has any considerable area of ground to go over, for it is not once only that it has to be done but after every watering, and as much oftener as one feels inclined.

◆

Storing Onions.

Storing onions in crates seems to be popular in America, as well as storing in well-ventilated cribs. An idea of the best practice in the United States is formed from the following by a leading grower in Indiana :—

When our crop ripens reasonably early we delay pulling until the tops are all down unless we want a few for early market. If the onions are planted late, or for any reason do not ripen until September, we usually pull as soon as a small percentage of the tops are down. In pulling we throw six drill rows into one windrow, being very careful to lay the onions lengthwise of the rows, with the tops lying over the bulbs. When thus pulled the bulbs are completely protected, from the sun and frost. We find it preferable to top the onions within a week after they are pulled, even though the tops are far from being dry. If the onions are topped immediately after they are pulled and cured in crates they will have a beautiful colour, and will keep just as well in storage. The sooner the onion is put in the shade where there is plenty of air the better it will cure and keep when stored, and the better will be its colour. So, to get the best results, we top after the onions have been pulled about a week. This gives the top enough time to wilt and stop growing. For the yellows and reds we use a topping machine, which will top from 1,000 to 1,500 crates per day. We have enough crates and ventilated cribs to hold our entire crop. Of late years we have not built any cribs as the same money that would build a crib would buy enough crates to hold nearly as many onions as will the crib. If the onions are put into the crates and stacked up in the fields, and covered with tops, they will cure out much better than they will in the crib. Of late years we build our storage room high from the ground with abundant ventilation in the foundation. We floor the room with battens, laid half an inch apart, thus leaving space for the air to pass up through the onions. The walls of the store contain two air spaces and are frost-proof. There are no windows whatever in the building, but we have a row of small doors just under the eaves.

◆

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Silver or Spinach Beet.

A most useful summer vegetable is the silver or spinach beet. The plant will grow in almost any kind of soil, and it resists drought better than most things. It may be had all through the year, but it is of most value during the hot, dry weather, when many other vegetables have perished for lack of moisture. Everv cook does not know how best to prepare silver spinach beet. The thin parts of the leaves should be removed from the main rib, as the amount of cooking required by the ribs would reduce the vegetable to a tasteless mass. The thin parts of the leaves should be cleansed in several waters, and left immersed in water for an hour previous to being boiled. The mid-ribs should be likewise cleansed from dirt, and if more than 1ft. in length, they should be sized, cut in halves, tied in small bundles, and be boiled in soft water. The water should be lightlv salted, and when the stalks sink in the water they are sufficientlv cooked. Silver beet may be sown now, or at almost any time of the year. If the vegetable is in excess for the kitchen, it may be fed to the cow; some persons grow it almost solely for cow-feed in summer. In gathering silver beet it is better to pull the leaves rather than to cut them; the cutting involves a loss of sap.

◆

Irrigation or Constant Cultivation.

The following experience of an American grower related in the "Rural New Yorker" draws attention to the immense value of soil stirring as an adjunct of or substitute for irrigation :—

With the former I have had little experience so I will speak of the latter method and relate my experience with a patch of melons containing about two acres.

With an early and otherwise exceptionally favorable spring and with the land in fine condition, I planted this field May 16, this being somewhat earlier than usual. Soon after this, cold, damp weather set in and continued, and about ten days later I feared my seed was spoiled; so to make sure of a good stand I replanted about June 1. This time I planted from ten to fifteen seeds beside the first hills and I now felt sure I was safe, and continued to cultivate, wait for warm weather and watch results 'I also stirred the hills frequently with a garden rake.

Of the first seeds I planted but few came up and these looked yellow and weak, while the rest were just below the surface ready to break through the ground and remained in that condition until June 10 with practically no change. The seeds planted June 1 were in about the same condition and showed no signs of improvement.

What was to be done? I was twenty davs late for planting and I had no seed left as I had saved only enough for twice planting and I do not, for various reasons, like to use melon seed bought from seed houses.

I waited three days more, made a very thorough examination of the seeds and decided it would be of no use to delay longer. On the morning of June 13 the disc was put into the melon patch. The land was thoroughly disced, next came the spring tooth harrow, going over the land both ways, this was followed by the fine tooth harrow; next in turn came the crusher and last of all the marker going both ways. The land was now in excellent condition. While all this was going on I went to find seed. I visited every seed store in Oshkosh, telegraphed the neighboring towns and large growers but no seed could be obtained. However, a telegram to a neighboring State brought the seed to Oshkosh by mail early next morning and before the sun had set June 14 the field was planted once more.

The weather was now more favorable and six days later the rows could be plainly seen. Large strong plants had appeared. As soon as the plants had a good start they were hoed and thinned to six or eight plants to the hill and when the danger from the striped melon bug was over we thinned them to three plants to the hill.

The fine tooth cultivator, a great friend of the melon and garden in general, was kept in constant use from the time of first planting until July 23 when the vines covered the ground so as to prohibit cultivating. That night a good shower of rain fell which, by the way, was the first rain the melons had had since planting June 14.

July 30 another light shower fell and to-day the vines entirely cover the ground and are in as fine condition as one could wish. There is plenty of fruit set and a great many are full grown and I think if we should have no more rain this fall we would still have a fair crop of melons.

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The Farm

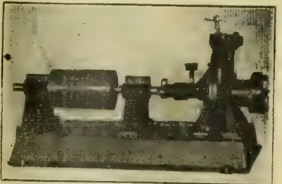
The Care of Machinery and Implements.

It is a matter for congratulation that the acacia-bush, the pepper-tree, and a clump of mallee have ceased to be regarded on the average up-country farm as the sum total of all that is necessary in the way of shade and shelter provision for the stripper and the plough. The improvement in the conditions of farming is not so much responsible for progress in the right direction as the improvements in tangible results which have of late years followed in the farmer's wake. Implements have improved so much in numbers and variety that the consideration of their welfare has fortunately become as important an item as that of the farm livestock. It is seldom, even now that the farm is provided with an implement-shed sufficiently commodious to hold the entire plant. As a general principle however, house room for machinery and implements does receive more attention in the planning of homesteads than ever was the case before. Ideas have expanded beyond a few waggon-loads of straw spread out on a framework, supported by uprights of sufficient substance to serve a useful purpose as rubbing-posts for all stock, small and great. Farmers have also got beyond the stage of regarding with feelings of equanimity the possibility of the roof fulfilling a double purpose—protection from wind and weather, and a reserve supply of feed in times of drought.

The improvement in shed equipment is due partly to the increased capital invested in and dependence placed upon mechanical appliances, and partly and more fortunately to a more adequate appreciation of the necessity of protecting the machines or implements from exposure to climatic influences when not actually in use. One has not to travel very far in any part of the country, more especially among the newer districts, to be afforded plentiful evidence of the need that still exists for greater care in looking after the farm implements. The difference between the care bestowed upon them on well-managed farms, and on others, where supervision is marked by less intelligence and skill, is very striking. On the former every machine or implement is carefully stowed away in a shed provided for the purpose, as soon as the term of usefulness is at an end. On the latter, however, even such costly and complicated machines as the reaper and binder may be seen lying for weeks and months, frequently in the open. More frequently they may be seen in some apology for a shed, protected by a flat straw roof overhead, but exposed on all sides to the rays of the rising or declining sun, to the wind and its accompanying dust, and to all drifting showers from any point of the compass. The part played by expensive machinery on farms of this description as a roosting and nesting place for the domestic fowl is not one of the least drawbacks to these open-sided sheds. Occasionally some sort of covering is thrown over the more vital mechanism, but the protection afforded is totally insufficient to avert injury by rust, far surpassing what is likely to be entailed in the form of actual wear and tear. What many farmers seem slow or unwilling to recognize is that the useful life of a reaping or mowing machine, or even of a plough or harrows, is sensibly curtailed by avoidable exposure to the penetrating influences of the climate. There is not a single implement or tool necessary to the farmer but which is well worthy of house room at such times as it may not be in active use. Rust is the great enemy against which it is necessary to safeguard steel and iron appliances, while the wooden parts are equally liable to suffer from wet rot, dry rot, white ants, and other forms of depreciation. During a recent trip through the North on many holdings, machinery and implements of all sizes and descriptions, could be seen exposed to all the varying temperatures appropriate to the season, whereas common sense suggests that they ought, out of just regard for considerations of economy, to be safely out of reach of the elements.

As has been remarked, the trouble seems due rather to insufficient recognition of the loss and depreciation resulting from exposure than to the fact that farmers cannot afford to put up buildings of a substantial nature to protect this portion of their working capital. Implement sheds might have seemed an unnecessary expense when the stump-jumper and the stripper—which could so easily have their combs protected, even when out in the open—constituted the beginning and end of any farmer's machinery list. But now that so many own harvesters, reapers and binders, and drills, farmers should realize that an immediate outlay in the direction of proper housing accommodation will in the long run effect considerable saving to their pockets. The use of water-proof sheeting as covers for reapers and other machines is certainly better than nothing: but this convenient method is quite insufficient to serve for the ten months of the year during which these machines are inactive. Ploughs, grubbers, and harrows, because of the absence of complicated or finer mechanism, are less liable to derive direct injury from exposure. These, however, are subject to depreciation from rust and other causes traceable to climatic influence, and the farmer who can lay claim to the title of careful insists upon their being put under cover as soon as may be convenient after their season's work is finished.

It is a common saying that one may form a fairly accurate opinion as to the industry, intelligence, and general competence of a farmer by the manner in which he looks after the plant that is necessary for the management of his land. If judged by this standard, there would seem to be at least as many incompetent and careless occupiers of agricultural land as there are those of a different and superior order.—Exchange.



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The House-Fly and the Diseases it Spreads.

Walter W. Froggatt, Government Entomologist.

No group of insects has received more attention from the hands of the naturalist during the last few years than the many species of flies.

These insects, belonging to the Order Diptera, are so called because, unlike most of the active flying insects, they possess only one pair of wings; the second or hind pair so well developed in other insects, as the hymenoptera, are replaced by a pair of tiny clubbed processes, that stand out on either side, and are known to entomologists as poiser, but these are of no use for flight, they assist in balancing the body when the fly is hovering over its food or visiting a flower.

— Flies and Disease. —

The subject is such a vast one that I shall confine my remarks to the role of the common house flies in the spread of disease. Investigations carried out on these new lines have proved that many of the most deadly diseases that cause the untimely death of thousands of people are due to the presence of the house-fly and the mosquito. In the near future, when people are educated up to these facts, no civilised town will allow any manure to accumulate or remain uncovered to breed flies; and all tanks, drains, ponds, and swamps will be covered, or else treated so that no mosquitos can breed in them.

Dr. Howard, of Washington, has proposed that we should drop the name "house-fly," with its harmless sound, and call it the "typhoid fly." While we talk about it as the domestic or house-fly, we will never realise that it is the active agent in spreading typhoid fever. The subject is not a savoury one, but it is necessary to state plain facts in order to show how tyhoid fever is spread. We all know how flies swarm over all kinds of food that are left uncovered— how they feed upon it by sucking up the moisture, or, if it is hard, how they discharge a little fluid down their proboscis to soften it. Not only do they feed upon all exposed food, but they discharge their excrement upon it; and then a thoughtless person eats this contaminated food that has been left in the pantry or on the dining-room table. Out in the street swarms of flies may be observed resting and feasting upon every bit of decaying matter; from such things they come flying into the house, their feet and mouth reeking with filth.

Experiments carried out during typhoid epidemics, notably during the Spanish-American war, plainly showed the means by which this disease was disseminated by flies. Under canvas, the cook's quarters were open, and the latrines were close to the hospital wards; the latter were sprinkled with lime at intervals. As the summer increased, the flies swarmed into the quarters where the food was kept, and the doctor in charge found many flies with particles of lime adhering to their feet, showing where they had come from.

Further examination of the excrement of these flies showed that it contained typhoid bacilli; so that the flies could, and did, contaminate the uncooked food, both directly from filth on their legs, and from their excrement.

Now, it has been pointed out that a man may be swarming with typhoid bacilli some time before he shows evidence of the disease, or is laid up, yet by the agency of the flies he is a centre of infection if the sanitary arrangements are unsatisfactory. There is far more typhoid fever spread by flies in this manner than from water and milk contaminated in other ways.

Another great danger from these insects is that flies that have been feasting upon a dead beast where decay has set in, or upon a beast that has died from such deadly diseases as anthrax, etc., can, if they settle upon an open cut or fester (so common upon the bushman's hands in summer), cause blood-poisoning by inoculating the cut or sore with putrid matter, or with the deadly germs of anthrax.

The danger of not keeping all such cuts and festers covered cannot be exaggerated. "Barcoo rot," so well known to the western man, when every tiny scratch, or even broken sun-blister, festers and becomes a sore that will not heal, is probably caused by a germ spread by the action of flies.

Howard, in his bulletin ("Economic Loss to the People of the United States through Insects that carry Disease," Washington, 1909), has accumulated a great amount of evidence from all parts of the world relating to the deadly diseases that are directly traceable to house flies, and he urges that everyone should do his utmost to destroy the breeding grounds of the common house fly.

He says: "Accurate scientific bacteriological investigations by Tizzoni and Cuttani in 1886 showed definitely active cholera organisms in the dejecta of flies caught in cholera wards in Bologna, Italy. These observations were subsequently verified and extended by Simonds, Offelmann, Macrae, and others."

Dysentry is only too well known in Australia, and among young children, in particular, many deaths occur from this cause, particularly in the summer months. It has been shown in America and elsewhere that this intestinal disease is always most prevalent in the summer months, when flies are at their worst.

The house-fly is also known to have the power of spreading the

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bacilli of tuberculosis. Dr. Lord, of Boston, published a paper on this in the "Boston Medical and Surgical Journal," in 1904, and Howard quotes his conclusions, of which the most important is that "Flies may ingest tubercular sputum and excrete tubercle bacilli, the virulence of which may last for at least fifteen days. The danger of human infection from tubercular fly-specks is by the ingestion of the specks on food."

The number of bacteria on a single fly may range all the way from 550 to 6,600,000. Early in the fly season the numbers of bacteria on flies are comparatively small, while later the numbers are comparatively large.

The domestic fly is passing from a disgusting nuisance and troublesome pest to a reputation of being a dangerous enemy to human health, a distributor of typhoid fever, dysentery, cholera, tuberculosis, blood-poisoning, and other similar diseases.

— The Breeding Grounds. —

Therefore every naturalist and every doctor should know something about the life history of the house fly and where it breeds. When we have learnt this we can take means to destroy the material and refuse in which the flies can breed, a much more satisfactory method of dealing with the pest than by trying to destroy the active flies. The chief place in which house flies deposit their eggs is horse manure. Any heap of horse manure piled up about a stable or yard will, within twenty-four hours, be found to contain swarms of small white naked maggots—the horse fly larvae; on the second day these are full grown; on the third day they have changed to pupae, and instead of white maggots, the more or less drying manure will be found full of oval reddish-brown cocoons, the pupal cases of the flies, from which, in three or four days, the perfect flies will swarm out ready to lay their eggs and carry on the next generation. This goes on all through the summer, so that, under favourable conditions, it is no wonder that flies become numerous. Packard placed a house-fly in a bottle at 6 o'clock in the evening, and at 8 o'clock next morning he found she had laid 120 eggs. How long a female domestic fly can live, and how many eggs she lays during her span of life, has not, as far as I know, been definitely settled. Though horse manure is the main propagating ground of the house-fly, and though all the flies, bred out of horse manure, that I have examined about Sydney are the true Musca domestica, yet Howard says: "Later investigations indicated that the fly will breed on human excrement and in other fermenting vegetable and animal material." Newstead investigating the habits of the domestic fly in Liverpool, England, found that, besides horse manure, rubbish pits and also masses of used hops thrown aside bred house flies.

— A Cosmopolitan Pest. —

The house fly described by Linnaeus in 1781 is one of the most widely-distributed insects known, and there are few parts of the world from which this cosmopolitan fly has not been recorded.

The common flies are a pest in all the warmer portions of the globe, and in the East, among the Arabs and kindred races, the common cause of blindness, purulent ophthalmia, is spread by the house fly, and one of the most disgusting sights among the children around Cairo is to see the flies forming a regular fringe round their eyes and resting on their lips and teeth, without them taking the least notice of them.

In Captain Dampier's celebrated voyage round the world in the sixteenth century, he records his opinion of the natives on the north-west coast of Australia: "The poor winking people of New Holland. Their eyelids are always half closed, to keep the flies out of their eyes, they being so troublesome here that no fanning will keep them from coming to one's face, and without the assistance of both hands to keep them off, they will creep into one's nostrils, and mouth, too, if the lips are not shut very close. So that, from their infancy, being thus annoyed with these insects, they do never open their eyes as other people, and therefore they cannot see far, unless they hold up their heads, as if they were looking at something over them."

In South Africa, most of the explorers found the house-fly one of the most persistent pests, and Dr. Sparrman relates, in his travels, how they swarmed into his house in such numbers as to almost entirely cover the walls.

There are all kinds of queer legends about the common house fly, and in most countries, particularly among the Eastern races, dreaming of flies denotes bad luck.

The doom of the house fly is sealed when the public awake to the fact that it is such a dangerous inhabitant of our streets and houses; and in the near future, in every civilised city, the doctors, entomologists, and sanitary officers will combine in the work of destroying the breeding places, and it will become a thing of the past.

It is probable that Sydney is no worse than many other modern cities as regards fly pests, but there is great room for improvement, and anyone who has to go through the cross streets where the cleaning and salting of bullock hides is going on, with the bits of fat and scraps thrown out, and bloody brine running into the gutters, or where horses are standing and feeding at all hours, cannot fail to notice the swarms of blue bottles, blow flies, and house flies that are to be found all over such lanes and streets.

How many butchers' shops are there in the city that are protected against these flies with gauze wire, as they ought to be? Nearly every butchers' shop has the whole front open to the street, with the meat hanging out exposed to the flies, dust, and heat of a Sydney summer, even in our main streets. Not only do the street flies have the run of the butchers' shops, but the windows of the confectionery,

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small goods, and fruit shops are full of flies resting on the food, or flying in and out as they please.

Also around our fruit and vegetable markets, and most parts of Sydney where market commodities are sold, the same conditions exist, as far as the flies are concerned. Nobody seems to take any notice or comprehend the danger of buying food upon which flies have been resting or feasting, yet these flies are laden with the filth of the street on their legs and mouths.

Take any of the country towns; not only do all the well-to-do residents keep a horse, but most of the hotels run a livery stable in connection with their business, often so close to the windows of the dining room that the energetic flies can swarm in from the manure heap (often accumulating for days in an open pit), where they have bred, and come romping over one's food and tumbling into one's tea.

The writer has a vivid recollection of one of his official trips to an up-country town in midsummer. He reached there at breakfast time, and was taken to the local hotel, where, among the food upon the table, was a large open jam tart, simply black with countless numbers of feasting flies. Towards evening he returned to the same hotel and had tea; the remains of that jam tart were still on the dining room table, and appeared to have been there all the day. It is needless to say that the flies were still skirmishing round it.

The fruit shops, confectioners' and small-goods shops are more dangerous than the butchers as germ distributors, because the food they contain is consumed without further cooking; and if anyone will stop to look into the ordinary shop where these commodities are sold, he will find a choice assortment of many kinds of flies buzzing round the windows trying to get out; yet no precautions are taken to exclude flies from these shops.

Though the tip of the city of Sydney is well looked after, there are some of the suburban ones that could be improved. In the majority of the country towns the refuse is usually simply carted out of the town limits and dumped down in some corner of the common or water reserve, and is a medley of rusty tins, old clothes, broken china, and decaying matter of all kinds, festering in the sun. The remains of the canned food in the emptied tins is sufficient alone to produce germs enough to infect the whole township.

A suburban resident purchasing a load of fresh horse manure from some stable to mulch his roses, can often, at the same time, obtain in it enough flies (in the pupal state) to overrun his house with this pest, while he wonders where all the flies are coming from. A stable of any kind in the suburbs is a centre from which house flies are often bred in sufficient quantities to infest all the adjacent residences. Until much more stringent rules are enforced by the inspectors of nuisances of the different municipalities concerning the storage and disposal of horse dung, flies will always be a menace. If, however, all stable manure is cleaned up every morning as it ought, and placed in covered receptacles until carted away, there will be no flies even in that stable; and until such methods are adopted, we will not get rid of the house fly.

— Remedial Measures. —

When, however, they are in the house, there are many methods by which they can be kept down with fly papers, fly traps, etc., though most people seem to have an objection to trapping and removing dead flies, and the housewife has an objection to finding dead flies "all over the house."

A poison that will kill on the spot is, therefore, to be preferred, and in formalin we have such a poison. Take a soup plate, and cut a couple of sheets of thick blotting paper to fit into the bottom; and sometimes half an inch of clean damp sand under the blotting paper will help to retain the moisture on a hot day; saturate the paper with water, and sprinkle it over first with sugar, then with about a quarter of a teaspoonful of formalin (diluted with a spoonful of water so that it will spread all over the exposed surface). Place the plate in a well-lighted spot, on the floor for preference, and the flies, attracted by the sugar, are quickly killed by the formalin, and usually drop dead on the side of the plate. Formalin, however, evaporates after a time, so it may be necessary on a hot day to renew the dose at intervals.

Flies must have moisture, and, therefore, if a room full of flies, from which all water has been removed, is shut up for a couple of days, or even less in summer, every fly will be dead when it is re-opened.

Fumigation is a very easy method of clearing a room of flies in a modern house, where all outlets can be closed. A number of different chemicals can be used; and though some of the chemicals are deadly poisons, and the fumes also poisonous to inhale, yet with ordinary care and precautions, there is comparatively little danger in using them.

Hydrocyanic acid gas generated in the same manner as we use for fumigating scale on fruit-trees in a closed room is sudden death to all flies. One ounce of cyanide dropped into 3 oz. of water, to which 1 oz. of sulphuric acid has been added, will give off enough gas to poison 200 cubic feet of space.

If the windows are previously unlatched, so that they can be opened from the outside to let the fumes escape into the atmosphere there will be no danger from the

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remains of the fumes in half an hour after opening up the rooms.

Another mixure used with success for flies and mosquitoes in America is carbolic and camphor. A pound of carbolic crystals is dissolved by placing the bottle in hot water. While liquid, it is poured over 1lb. of camphor, which is first broken up into small bits. The resultant mixture is a thick yellow liquid, which is securely bottled up, and must not come in contact with the skin. An ounce of this placed in the room (in a shallow dish upon a stand, under which is a spirit lamp to evaporate it), will kill all flies in the room. Three ounces will fumigate 1,000 cubic feet. The best method to use sulphur for fumigation is to mix 1oz. of powdered charcoal and saltpetre with 8oz. of flowers of sulphur, and then wet it with gum water and mould it into a cone or pastile. One of these 9-oz. pastiles, when lighted in a closed room, will fumigate 1,000 cubic feet of space.

Ordinary insecticide, if sprinkled along the window sills will kill all the house and blow flies that get amongst it when buzzing round the window.

In most of the better class houses in the country wire gauze windows and doors are in general use for excluding both flies and mosquitoes, while many of the landholders' homesteads have the broad verandahs rendered fly-proof with gauze wire.

The use of wire doors and windows in Sydney is not usual, for many of the houses are not built so that they can be easily fitted, and many people think that the air does not circulate through the house as well as when the windows are free.

The first thing, however, is not to let the flies breed; and as soon as their breeding grounds are closed down, and the material in which they breed is treated so that no flies can get out if the eggs have been laid in it before it is collected, the plague of flies will soon come down.

While the domestic fly is the common house insect in the outback country and bush lands, it is the smaller species, Musca corvina (also cosmopolitan in its range) that is the great pest of the bush. It torments man and beast from sunrise to sunset all through the summer months. In the interior, from the first glint of morning sun till darkness falls, one is enveloped in a swarm of flies that nearly drive one crazy. Every bushman wears a fly-net round his hat, and the sundowners, or swagmen, coming in from outback will often have a ring of strings, to which are attached little bits of cork, swinging to and fro, keep the flies out of his eyes.

In these days of scientific sanitation it is surprising that our civic authorities have not taken up the most important question of destroying the breeding-grounds of the house-fly, now that its habits, life history, the food supplies of its larvae, and danger to man from its presence are so well known.

The expense of seeing that all householders who accumulate material in which flies breed, cover over such matter so that flies cannot gain access to it, until it can be carted away to the tip, or treated for garden manure, would well repay the outlay. It would also be necessary to see that all decaying matter is well buried, if not burnt at the tip; and suburban residents and nurserymen have receptacles or covered pits in which to keep their garden manure.

All open or box privies should either be abolished or enclosed, so that flies cannot gain access to them. All human excrement should be destroyed or covered at once; such matter, washed into the water-holes in the country, with the first rains after summer, has been often responsible for outbreaks of typhoid fever. Typhoid germs are more common than is generally imagined, and the swarms of flies are the chief agency in scattering them about.

In conclusion, I would again quote Dr. Howard: "Even if the typhoid or house fly were a creature difficult to destroy, the general failure on the part of communities to make any efforts whatever to reduce its numbers could properly be termed criminal neglect; but since, as has been shown, it is comparatively an easy matter to do away with the plague of flies, this neglect becomes an evidence of ignorance, or of a carelessness in regard to disease-producing filth which, to the informed mind, constitutes a serious blot on civilised methods of life." —N.S.W. Agricultural Gazette.

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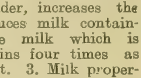

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The Composition and Use of Butter-Milk.

Butter-milk contains chiefly the smaller globules of fat present in the milk which have not coalesced under the influence of the churning to form butter. Its specific gravity is slightly higher than that of ordinary milk, owing to the smaller proportion of the lighter fat globules present in it. At an ordinary temperature its specific gravity varies from 1.032 to 1.035. The non-churnability of the fat present in milk when the globules are of very small size is the principle upon which rest the machines called homogenizers. These, by forcing the milk through a strainer of very minute mesh, reduce the fat globules to such small and regular size that no amount of subsequent shaking or churning leads to the production of butter.

SCRUB-ROLLING NEAR COWELL.

The butter-milk ordinarily obtained is either more or less sour or quite fresh, according to the state of the cream which has been churned. Butter-milk obtained from sweet cream appears very much like a rich, fatty milk or a very poor cream, and though at first sweet also, soon assumes a bitter or acid flavour which becomes very distinct if it is slightly warmed.

The addition of cold water during churning, which is a very frequent practice in some dairies, causes the production of a butter-milk, which, since it thus contains a very large proportion of water, is very poor in fat.

The average composition of butter-milk, without the addition of any breaking water, is given by Fleischmann as the following. The figures are, naturally, the average obtained from a large number of experiments :—

Water	91.24 per cent.
Fat	0.56 ,, ,,
Protein (rasein) ...	3.5 ,, ,,
Lactose (milk sugar) ...	4.0 ,, ,,
Ash (mineral matter)	0.7 ,, ,,

The proportion of fat present in the butter-milk will vary according to the ripening of the cream, the consistency of the cream, its churnability, and the temperature at which churning takes place. In especial cases, with skilled handling, it can be reduced to as low as 0.1 per cent. The remaining figures are found to suffer little variation, even under widely divergent conditions and circumstances.

As a food it must be admitted that its value has been and is considerably under-rated. Seeing that it is, if unwatered, an excellent, nourishing, and health-giving article of diet, it is not consumed by the general public to anything like the degree which it deserves to be on its merits. Even in town dairies, where it is easily obtainable at 1d. or 1½d. per quart retail, it is not largely purchased, except for some short period during the great heat of summer.

Yet in the houses of those who produce milk and can obtain it direct from their own churnings, or as received back direct from the creamery, it frequently is valued as it deserves to be, and its use, both as a drink and in the making of cakes, is widely spread. The butter-milk scones, so highly valued in some districts, owe their especial attraction to the use of butter-milk in the making of them. It has been shown to have a desirable laxative effect upon the organs of digestion, and hence is of considerable medicinal value in cases of habitual constipation.

Its use in cases of typhoid fever has been shown to be beneficial, and as a remedy in cases of kidney trouble it has been found very valuable. Cases are not infrequent where a patient suffering from gastric ulcer or cancer of the stomach has been unable to retain any food except butter-milk.

It is much to be regretted that the only use to which it can be put in many places is to serve as food for cattle, more especially for pigs. For this purpose it is often mixed with the separated milk received back from the creamery.

If the butter-milk is excessively sour it should be boiled before being used, and should not be used in large quantities at once. It will be found that the swine thrive better on it if it is used in lesser quantities at one time, but on more frequent occasions.—Mark Lane Express.

It costs more money to get a start breeding thoroughbreds than it does scrubs, but it pays so much better in the long run that there is really no argument in favour of keeping mongrel stock.

Exaggerated Emphasis on Type.

It will bear repetition, writes "The Farmers' Advocate," that the contrast between beef and dairy type, as commonly exemplified in the showring and in photo-engravings, is, to quite a large extent, a matter of condition. Every stockman has noticed what a great difference in type there is between a cow in lean condition and the same animal with her ribs padded out, the concavities of her outline filled up with flesh and fat, and the angularities, accordingly, smoothed into more symmetrical contour. We have seen cows which, in milking condition, would answer very well to illustrate a lecture on dairy type, while, eight or ten months later, when fattened for the block, they would illustrate almost equally well the butcher's ideal. Of course, it is not pretended that all cows are built according to the same lines of structural anatomy. There is a difference in skeletons, and also in the inherited disposition to lay on flesh and fat in certain parts of the carcass. An approved beef animal lays it along the back and over the ribs, while the dairy breeds store a larger proportion of it inside the abdomen in the form of tallow. But these differences are magnified out of all proportion by those interested in representing diversity of type, and in the showring they are enormously exaggerated by the practice of showing the dairy breeds in thin condition, while the beef cattle are padded out with nutriment to make them slow as compact plump and thick-fleshed as possible. Were the practice reversed, and Ayrshires and Holsteins exhibited with slack udders and in beefy condition, while Shorthorns, Angus and Galloways were shown in their customary breeding condition and in full flow of milk, the untutored visitor would suppose the former were the beef and the latter the dairy breeds. Even between Jerseys and Aberdeen-Angus there is no such radical difference of type (condition being in each case equal) as photo-engravings or show-ring exhibits would lead one to believe. Moreover, it is safe to say the difference between the conformation of beef and dairy types would be less than it is but for the fact that educators have in the past led dairy breeders to select and endeavour to perpetuate such characteristics as the wedge-shape, the corrugated spine, extreme spareness of flesh, and a general looseness and ranginess of type. There is no doubt that undue emphasis has been placed upon such points, and the best dairy breeders of the present day no longer seek them to the same extent as formerly. They realize that a dairy cow requires not merely "belly and bag," but heart and lungs as well, and that extreme spareness of flesh, so far from being a guarantee of milking quality, may be only due to lack of thrift. In fact it is now pretty generally conceded that type is an unreliable index of milking quality. Private and public records show that some of the best milk and butter records are made by the substantial types of cows, or what the Holstein breeders have termed the milk-and-beef type. Not to go too far from home, we have in mind a very good illustration of this type in a Holstein cow at the Ontario Agricultural College, which, in her four-year-old form, gave over ten tons of milk, and fat equal to over 900 pounds of butter, within a twelve-month. This cow, if fed for the butcher, and her horns and color changed, would pass easily for a Shorthorn of the dual-purpose type. It all goes to show that beef type and dairy capacity are by no means incompatible. True, it would not be easy to develop the combination quickly in high degree among a large number of individuals any more than it would to develop any other two excellencies in a strain. This does not argue that the two things are incompatible. It is merely according to the principle of restricted selection, as illustrated by the fact that it is harder to find one hundred men who are both tall and stout than to find one hundred who are merely tall. Nevertheless, with careful selection, and a few generations of time, the development of dairy quality in cows substantially of the beef type, and with the inclination to lay fat on their backs, instead of about the paunch, would be but little more difficult than in those conforming to the old-fashioned attenuated dairy type, or to any other single type that might be designated. And they would have the advantage of being more rugged and wearing better, while a superannuated matron or sire would be worth more when driven over to the shambles.

Let the breeders of dairy cattle, therefore, while keeping their ambition centered on milk and butter-fat seek to combine with this, so far as convenient, a fairly smooth, hearty and substantial type: while breeders of beef cattle, on the other hand, will do well to encourage a liberal degree of milking quality, and Shorthorn breeders, in particular, concentrate their effort on a judicious combination, in high degree, of beef type with dairy capacity. The idea is feasible, but it requires time, judgment, and persistent development of milking, together with yearly records of milk and butter-fat yields, to accomplish the ideal. It can be done.

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Cream Cheese.

Cream cheese is made from the "strippings" (the last of the milk drawn from the cow at each milking), from a mixture of milk and cream, or from raw cream only, according to the quality desired. It is usually made in small oblong, square, or rounded cakes, a gentle pressure only (that of a 2lb. or 4lb. weight) being applied to press out the whey. After twelve hours it is placed upon a board or wooden trencher, and turned every day until dry. It ripens in about three weeks. A little salt is generally added, and frequently a little powdered lump sugar.

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A Millionaire's Dairy Farm.

Modern dairy farming, if properly carried out on the exacting lines laid down by bacteriologists, pathologists, and scientific authorities, has, on more than one occasion, been described by long-suffering countrymen as a rich man's hobby. It is certainly a hobby of which some rich men are very fond, and it is largely due to their force of example that a new era of sanitary cleanliness has been inaugurated in dairying operations —of cleanliness concerning the cows and cow stables, milking, and the handling of milk. Among these rich men who have the welfare of the industry at heart can be included at least two millionaires—one in England at Tring Park, a member of the Rothschild family, and the other in North Carolina, one of the Vanderbilt faction. Many interesting details of the of the latter's palatial establishments have been graphically described in a New York paper. From this we are able to cull the more salient features.

The dairy consists of 184 cows, all registered Jerseys, and of the best strains procurable. This breed was selected in preference to all others on account of their well-known large yield of rich milk and their uniformity of production. The herd was started seventeen years ago, before the cry for dairy reforms and sanitation had become quite as acute in Australia as it is at the present time, and consisted of 40 head of the choicest selections that could be obtained in America. By dint of extensive importations and by exercising the greatest care in breeding, the finest collection of heavy milch cows in the United States was eventually got together.

In addition to the milch cows, there are ten service bulls and about a hundred head of young cattle are continuously reared up to the age of six months. They are then drafted off to a nursery farm three miles from the dairy. Some of the cows are raised for additions to the herd, or to be disposed of at the annual stock sales. The others are sold privately for breeding purposes.

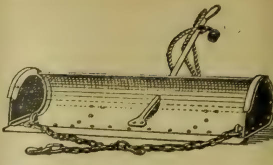
The conditions of paramount importance in the management of this dairy are the sanitary condition of the cows and the cleanly handling of the milk. The cows are inspected daily by a qualified veterinary surgeon and careful tuberculin tests are made. No cow below the highest health standard is ever kept with the milking cows of the dairy.

The cows are kept in stables specially constructed with a view to sanitation and cleanliness. To check, as far as possible, the formation of offensive odours in the stables, they are repeatedly cleaned, both at night and in the daytime. When the cows are in the stables the manure is removed through trapdoors, which close tightly. The feed-troughs are kept clean by frequent and thorough scrubbing, wire brushes being used for the process. In winter, even during the coldest weather, the cows are turned out into the air and sunshine for a time every day, in order to give them, as well as the stables, a thorough airing. The cows are carefully groomed to keep their skin in a healthy condition, and their udders and flanks are thoroughly washed before milking.

Special care is taken to guard against the contaminating of the milk by the milkers. They must be in good health, and so must their families. They must keep their hands clean, and are required to wear sterilized suits over their working clothes, and a special pattern of linen cap whilst they are milking. All the other employes must likewise be well, and do clean work. No one is employed in the dairy who is not pronounced well by a competent doctor.

A system in vogue at schools of imposing bad marks for bad conduct has been introduced here among the employes. They receive bad marks for negligence, loafing, untidiness, forgetfulness, and carelessness in their work, and a prize of £100 is given at the end of each month to the one who receives the least number of bad marks. Another novel form of departure, serving to keep aroused the interests of the milkers in their work, is the milking contest which takes place at the annual State Fair. The work is closely inspected, and the men are graded in accordance with their proficiency in a number of particulars.

From 25 to 30 men and women are regularly employed to do the dairy work, under the direction and superintendence of two expert dairymen. To better protect the milk from dirt particles, and hence from the introduction of disease germs, while the milking is being done, milking pails of special



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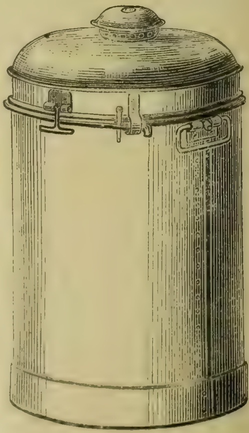

construction and covered with strainers, made of cotton cloth and absorbent cotton, are used. The milk is strained a second and a third time through similarly made strainers, the last time by gentle gravity pressure. The milk yield is from 325 to 350 gallons a day. The milk from each cow is weighed after each milking, and a weekly, monthly, and yearly record is kept of the milk and equivalent butter yield of the herd.

The milk is conveyed from the stables to the dairy building by means of overhead trolly wires, and is rapidly cooled by running it over a specially-constructed cooler (a large refrigerating plant being used during the summer months), and is then sealed from disease germs in sterilized bottles with as little exposure to the air as possible. The sterilizing of the bottles consists in first washing them with a strong lye solution by means of rotary brushes, and then treating them with live steam for at least twenty minutes. And not only are the bottles kept chemically and sanitarily clean, but all the apparatus and utensils of the milkroom are kept clean and repeatedly sterilized.

High quality, as well as purity, is, of course, a feature of the milk. Its richness is, incidentally, but very decidedly, shown in the bottles in which it is delivered to customers, by the colour of both the cream and the milk, and by the cream curve, which is very decided, and is often halfway between the mouth and the bottom of the bottle. The cream that naturally separates from the milk in the bottle measures from one-third to one-fourth of the contents of the bottle. The dairy has considerable patronage from families who use its skim milk in preference to the whole milk of other dairies, as a cleaner, richer, and less expensive product.

The milk is guaranteed to contain 4½ per cent. of butter fat, but it generally contains more than 5, and frequently 6 per cent., especially that from the afternoon milking. The milk and cream are frequently tested. A composite Babcock sample of four consecutive milkings is taken each month from each cow.

The milk is hauled in specially-constructed waggons, with enlarged beds for holding ice boxes in summer to contain the bottles, and is delivered to customers icy cold.

The special object in starting this dairy was a personal, educational, and philanthropic one, and not primarily the making of money. But it is a paying concern now. Good Jerseys, good management, and square dealing with customers, including the using of full quart and pint bottles, and leaving no air spaces below the covers, have made it so; and it is no doubt destined to become the most profitable dairy, on a milk basis alone, in the country.

A large quantity of the surplus skim milk of the dairy is used as additional food for a herd of pasture-raised hogs. The pigs are pure-bred Berkshires. They are kept for breeding purposes only, and are sold to pig-breeders all over the country.

Yearly sales of young Jerseys and of Berkshires at public auction are made on the dairy grounds, and on account of the rare opportunities that they offer for obtaining the best types of these world-famous breeds they are numerously attended and by representative breeders throughout the country.—Elder's Review.

◆

The Modern Version.

"'Where are you going, my pretty maid?"
"I'm going a-milking, sir," she said.
"Dear maiden, I'd like to disclose the fact
That I'm an inspector under the Act.

"So pray remain, for I want to know
A thing or two before you go.
"Nay, pretty maiden, you must not weep;
How far away are the pigs you keep?

"And what percentage of butterfat
Does your moo-cow yield? Pray tell me that.
"And how is the health of your pretty pet;
Has it anthrax, cancer, blackleg, garget?

"Has your sister measles or whooping cough;
Is the water clean in the drinking trough?
"I pray thee answer these questions of fact,
For I'm an inspector under the Act.

"With the fierce bacilli also I 'ope
By means of my powerful microscope.
"Excuse me, I must examine your hand,
Purely official, you'll understand."

—Farmer & Grazier.

◆

The ripest maize should always be cut first and placed in the bottom of the silo, because the greater pressure near the bottom will tend to exclude the air.

A sow remains prolific for five or six years, and a mature sow is a more constant and careful mother than a younger one, and will produce larger litters.

Keeping a foal unnecessarily long with his dam cannot fail to have prejudicial effect upon the foal she is carrying, and also to enfeeble the mare. And foaling-time is the crucial time in the life of a young mare.

For the silo grow plenty of maize and leguminous crops. The maize should be allowed thoroughly to mature, and should not be cut until the grain has reached the "dent" stage of growth. Lucerne is still better, as 11lb. of it are equivalent to 8lb. of bran.

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About Some Donkeys.

Ere long the art of catching the wild donkey of the North promises to become obsolete. In the catching of a thief it has long been regarded as politic to employ a thief. Though it has equally long been recognised that the world possesses a superfluity of donkeys among its biped inhabitants, the theory that any sort of the one species would prove efficacious in catching the other has long since been exploded by practice—at any rate, so far as the wild donkey of the North has ever been concerned. It takes no dunce to secure this particular type. It is only when the craft and cunning of man come to be pitted against those same attributes in the quadruped that he realized that the animal which has so long reigned in the abstract as symbolical for all that is stupid can easily prove itself his master.

Time was, and by no means long ago, when tribes of the type were comfortably established in the Flinders and Freeling Ranges, and among the hills at the back of the Beltana and Wirrialpa. From this vantage-ground they could bray forth defiance at their would-be captors on the plains, and did so with commendable effect, until the price set upon their heads rose high enough to evoke the spirit of avarice. Prior to this however, was the period of the wild donkey finding trouble in the form of bullets, and a value much enhanced by death — for the carcass could be offered up as a poisoned sacrifice to the equally wild dog of the same region. Then, too, another form of trouble arose for the reputed owners of the wild donkey, through diverse complaints from neighbouring runholders. Being no great respecters of fences, the tribes would establish outposts beyond their proper boundaries. Complaints of the damage caused by the trespass would be met by suggestions that a remedy lay within the power of the aggrieved neighbour—impound the culprits and assess damages against the owners. That it would have been a cheap way for the proprietors to come by their own did not lessen the difficulty. Then the rifle up and spoke, and dead donkeys were to be met with, served up in bulk or scattered piecemeal over the landscape to tempt that other pest, the dingo, to its destruction.

Those days belong to twelve-year-old history. The cry of "up goes the donkey," with which frequenters of old English fairs, or even of the modern metropolitan circus, have long and often been familiar rose in the land, and the animal, which had long enjoyed but a transient value, though a comparatively peaceful, even if wild, existence, rose correspondingly in demand. Rewards on a sliding-scale, ranging from 10s. to £1 per head set men in the field in solid earnest pursuit of the wild donkey. If the building of yards at the known watering-places, the arrangement of traps and pitfalls and the possession of a stout equipment of greenhide ropes, sidelines, lassoes, and hopples, and of stout hearts and fleet horses could have settled the campaign, then would all the tribes have been gathered in by one mightly sweep across mountain and plain. The difficulties which beset Kitchener in pursuit of De Wet were no less aggravating, and for that matter no less numerous. The donkey-hunters were not long in realizing that the heights to which the hunted donkey could ascend were only to be surpassed by the heights to which the animal's intelligence could also ascend to meet each subtle occasion. Trapping-yards at the water, John Ass would decline to visit his favourite drinking-spot, and if unable to find satisfaction elsewhere would remain away long enough to perish, and thus spite his enemy, the pursuer. His powers of resistence lay in sticking to the hills. There he could trot up and down, round and over, until condition failed the pursuing horse and language the pursuing rider. The keenest of hearing and smelling faculties — the slightest sound would arrest attention and cause the rigid cocking of those enormous ears — a broken stick lying across the customary path or pad would arouse a suspicion which the leading donkey would there and then communicate to his followers and immediately sound the retreat. The men who scored were those who watched their opportunity to cut off retreat to the hills, and pressed the quarry wherever the going was good, gradually making play from one confederate to another, until the little mob was edged off to the plains. Then a few quick dashes at the leader, a successful cast of the lassoo, and the hunter could get alongside his victim and pull him up so as to grab it by the nose. In one respect even this particular type of wild intelligence is deficient, and therein stamps itself as no exception to the abstract form of consummate ass. Stop it from breathing through its unhandsome nose, and it makes no attempt to continue the process through the mouth; it sinks on its knees, can be rolled on its side, and expeditiously secured with hopples and sideline. When thus caught the animal is completely cowed, can be shouldered along by the hunter's horse in any desired direction, or secured on the ground, pending further developments. When thus caught they can be driven and coaxed along without resorting to any extremes of punishment. To indulge in the process of belting the prisoner is to arouse a very strong innate faculty known as the sulks; and, as already mentioned, with a subject which can commit suicide rather than face unknown but suspected danger, there is no saying what it will or will not do of an aggravating nature if too violently assaulted.

Sometimes the task of catching these wild donkeys is so simple that one wonders how it is that they have so long and so successfully eluded capture. One of the most notorious donkey outlaws on Beltana was successfully yarded one evening by the late Mr. N. E. Philipson, with his buggy team of four mules. The simplicity of the proceeding must have surprised the donkey somewhat, and therein rested the success of the performance. Men on horseback, long whips, lassoes, and all the impedimenta of warfare to which that donkey was accustomed would have seen it scale the highest peak in the quickest time on record. One man, who had made more than one substantial cheque at donkey-hunting, recently pointed out to the writer the scene of a haul of fourteen made by himself and his mate before breakfast. As this meal is of an elastic nature in the bush, no enquiries were hazarded as to the position of the sun when the fourteenth was secured.

There are probably no finer representatives of the genus donkey anywhere in the world than those born and bred in the North. Descended from the most revered strains of ancient Egypt, mediaeval Spain, and modern America, nothing finer for constitution, size, and endurance is to be met with anywhere. What the Northern donkeys can accomplish when worked in teams is a revelation to travelled visitors, more especially army officers; and what they can endure as beasts of burden, fully packed, on the humblest of bush fare, with and without water, can only be appreciated by those who very wisely employ them during periods of drought.—Elder's Review.

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The following is a simple but sure way to tell good from bad eggs. Fresh eggs should be more transparent in the centre than elsewhere. A fresh egg will sink in a brine solution made of 1oz. of salt to a quart of water. A stale egg will swim about, and a really bad one float on the very top. The vessell used should have a smooth, level bottom.

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From Generation to Generation.

One learns much that yields food for thought in the study of his cattle Why is it that individuals differ so widely in the response they make to feed? I speak as an amateur in the art of animal breeding. One yields milk and continues to do so through a long milking period as though milk production were the constitutional habit of her system; it seems the most natural thing in the world for her and even under adverse conditions the habit still remains. Another presents a fine appearance at calving, makes a good beginning, then lags in the race, and the final return measures not at all above the average. In the one, the influence of all internal agencies seems to be toward the conversion of feed into milk, in the other there is a lack of harmony somewhere amongst these vital forces, and there seems to be an impediment that hinders and obstructs. The system of the one is free, that of the other is bound, constitutionally so. I can phrase it in no better way. In the one instance the breeder works as it were in co-operation with nature: in the other, at best he finds an uphill fight and makes but a lean return.

What may be the explanation? I take it that if we would unravel the mystery of heredity and the science of breeding we should find our answer These still, however, present problems that are not yet solved, but nevertheless, I am convinced that practically we may learn many things. May we emphasize first the importance of individual animals? May we not often fail to give due credit to the excellence of individuals in the herd? I believe that one cow may be worth more to her owner, looking toward herd improvement, than all the rest of his cattle put together. Milk production is more than an acquired characteristic: it is a property that may be latent or active in the blood. When we find an individual with all the natural vital forces of her constitution in such harmony that she responds freely and without restraint to the efforts of her owner to make her yield a generous return, he cannot afford to have those vital potent agencies dissipated wastefully by indiscriminate breeding, but must seek to introduce them into the blood of others of his cattle looking to the improvement of another generation. The history of a breed may be written as a biography of the influence of its outstanding animals, and if we would breed wisely we must find and use the scattered individuals that excel.

The thought has come to me that we may compare the progress of breeding to the passage of a stream of water Into it comes at various intervals the slow stagnant water of a level country side. The stream it even more lifeless than before. Such is the union of blood in cattle where there is no dominant characteristic, but mediocrity. It marks rather recession than progress, for mediocrity can scarce maintain, even through its volume, what has already been attained, and lacks altogether the power to renew and improve. Then again the stream may receive a tributary whose source lies away in the mountains and the clear swift torrent of the upland pours its power and energy into the turbid river which feels the influence of its life for miles and miles. Of such is the appearance here and there of individuals that excel.

Let me make my moral clear. Sires are all too frequently used in a herd that yield nothing to it of vital energy or of individual strengths. Their dams and their sires' dams were but drudges that could barely pay their way. Their ancestry was of a negative sorts with no positive element in it, and their blood was as lifeless as the waters of the stagnant river. On the other hand a sire may be used that will bring the herd to life again. He has behind him the heritage of intense life, and his blood is as virile and fresh as the sparkle of a mountain torrent. There is power in blood and we must find the individuals that possess it.

But whence came this power? We have yet to emphasize the importance of pedigree. Pedigree is almost valueless unless the animals appearing in it be known, and it is my own belief that only the near ancestors are of much importance. In the Old Testament dispensation, the sins of the father were visited upon the children not farther than the third or fourth generation, and I question whether in cattle breeding the virtues of the parents are manifested for a much longer period. It is true that irregular characteristics will appear for many generations after any introduction of foreign blood but when a type is fixed, the influence of remote ancestors will scarce merit consideration. On a well established breed I take it that a pedigree has very little value except as it obtains it through the merit of the top crosses.

In the pedigree of milking cattle it is again the performance of the dams (with all that it signifies of active nutrition and secretion) that counts for a very great deal. Together with this is the happy union of strains through the mating of sire and dam. May we define the "Nick" in breeding as the ability of the breeder to keep the blood of his cattle fresh and virile, and in that way, prepotent. Too great similarity or consanguinity of blood relationship must eventually end in stagnation and deterioration. It may be that there are possibilities of outcrossing which will yet find favor, though now condemned. Shall it be mentioned, however, as a final word that there are few agencies which will so assist in preserving the activity of blood as a vigorous existence and a natural unpampered life. Herd improvement follows the study of the individuals of the race and marks the ability of the breeder to choose and breed and feed.

H. S. ARKELL.

◆

Good Breeding Pays.

One of the factors that is injuring the dairy business is that so many farmers are content to use any kind of bull that will get their cows in calf. It is not fair, though, to place all the blame on the bull for a great many of the cows should not raise a profitable calf if mated to the best bull in the country. Some farmers appreciate the value of a good bull and we frequently hear them speak of their herd header, which might be a very good one, as though he were going to regenerate the whole herd in a very few years and then when we see the cows we find a lot of animals of non-descript breeding—a great many of them just mean scrub cows. It seems like throwing money away to buy a good bull to mate with such females. But it is perhaps better than using a scrub bull. This grading up process is a slow one. Instead of putting all the money into a bull, if farmers would keep their eyes open for good cows as well and thus improve both sides at the same time they would much more quickly get the results they are after.—Exchange.

◆

Trouble is sometimes found in getting mares in foal. But this is usually overcome by some one of the many practices known to all first class grooms. It might be said, however, that a horse during a heavy season is not so likely to impregnate a mare, "hard to catch" as a horse serving but a few.

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Pigs and Their Management.

From Queensland Agric. Journal.

— Weight of Sows and Pigs at Birth. —

Some interesting comparisons have lately been made with the object of putting on record data concerning the weights of sows before and after farrowing, weight of the afterbirth, and weight of each pig at birth. The sows on which observations were made were ten in number, and were pure-bred Poland-Chinas and Berkshires, crosses of these breeds, or cross-bred Poland-China-Chester Whites. They ranged in age from 1 to 4 years, and in weight from 240 lb. to 577 lb. The average weight before farrowing was 382·1 lb.; after farrowing, 359 lb. The average weight of the afterbirth was 4.01 lb. The litters averaged 16.7 lb. each. The individual pigs ranged in weight from 1.3 lb. to 3.1 lb., the average being 2.2 lb. There were from five to twelve pigs in a litter, and in general the individual pigs in large litters were somewhat smaller than those in small litters.

In a litter of pigs there is often one much weaker than the others. This is often called the runt, or teat-man. It is frequently spoken of as the last pig farrowed, this occurrence being supposed to cause inferiority. This idea was not borne out by the facts observed. The first pig born in one of the lots weighed 2.1 lb., and the last 2.6 lb. In other cases the pig farrowed last weighed less than the one farrowed first. In this matter, however, no regularity was observed, and it is stated that no weakness or other inferiority was observed in the last farrowed.

SKIM MILK.

— Results of Experiments. —

Says and agricultural bulletin:—Skim milk should always be used when it is available. It is not only a good flesh-producer in itself, but it also makes the ordinary grain feeds more digestible, so adds greatly to their value. While skim milk alone is rarely profitable—from 20 lb. to 40 lb. being required to make 1 lb. of meat—when mixed with grain in the proportion of 3 lb. or less of milk to each pound of grain, its value is greatly increased. In a test reported, 1 bushel of maize produced 10 lb. of pork, and 100 lb. of skim milk produced 5 lb. of pork, when fed separately. When fed together, however, the mixture produced 18 lb. of meat, an increase of 3 lb., due to the mixing. In this case 100 lb. of skim milk took the place of 44.8 lb. of maize. If the maize was worth 1/0½ a bushel, the milk was worth 9½d. per 100 lb.; if the maize was worth 1/8, the milk was worth 1/3½. Extended tests in the feeding of skim milk have been made at the Utah Station, and among the facts brought out by them are these: "The pigs fed on the milk-and-grain ration made much more rapid gains than either those fed on milk alone or on grain alone. The time required to make 100 lb. of grain was 79 days for the pigs fed on milk and grain, 116 days for those fed on grain alone, and 147 days when the feed was milk alone. The milk-and-grain lots required 2.58 lb. of digestable matter, the milk-fed lots 2.85 lb., and the grain-fed lots 3.19 lb. to make 1 lb. of grain in live weight." In this case 10 lb. of skim milk took the place of 2.32 lb. of grain in the mixture. Work at other stations has given very similar results, and has demonstrated that when not more than 4 lb. of skim milk is used with each 1 lb. of grain the milk is worth from 7½d. to 1/3 per 100 lb. The younger and the smaller the pigs, the higher is the value of the milk. For full-grown and aged animals it is of less value. Where it is impossible to secure enough skim milk for all the pigs, the available supply should be given to those pigs nearest the weaning age, and to sows suckling pigs.

CHARCOAL AND ASHES.

Unquestionably charcoal is a valuable hygienic agent for pigs. It is a corrective, and certainly prevents some diseases arising from disordered digestive functions. Wood ashes act similarly, or at least minister to similar wants. Both charcoal and ashes are freely used by the leading American swinegrowers.

There is no need to fix quantities. The best way is to keep both substances within reach of the pigs, and allow them to consult their own tastes and needs. If you use commercial charcoal, throw out half a sack at a time in a clean, dry corner, and supply more when used up. All the wood ashes from the kitchen fires can be used in the same way. If you have waste wood or rubbish burn it in the big paddock, and wet it down before entirely consumed, and the pigs will take care of it.

PEANUTS.

Peanuts are very rich in protein, and so are especially valuable for animals which are growing. Their yield in bushels is much greater; and as they are rich in muscle-forming materials while sweet potatoes have their chief value as fat-producers, the two supplement each other. The best variety for grazing is the Spanish, which yields fully as well as others, and its compact growth makes it easier to cultivate. On soils of medium fertility and with ordinary care a yield of from 50 to 75 bushels per acre may reasonably be expected, and as the hogs do the harvesting the expense of making the crop is much less than for securing an equal amount of food from most other crops. Some recent work at the Alabama Experiment Station shows the high feeding value of peanuts in a very striking manner. Six pigs, with a total weight of 184.3 lb., were used in the test, which lasted six weeks. The peanuts were grown on about one-sixth of an acre, and during the test 373 lb. or a little more than 6½ bushels of corn were fed. At the close of the feeding the pigs had more than doubled in weight, having made a gain of 196.4 lb. Valuing the corn at 40 cents per bushel and the pork at 3 cents per lb., the peanuts, when harvested by the hogs, were worth 18.34 dollars per acre.

The expense of cultivating the peanuts was much less than for cultivating an equal area in cotton, and the thin, sandy soil on which the nuts were grown would not have made more than 200 lb. of lint per acre, while the yield of peanuts was 62.6 bushels per acre. In another test at the same station, peanuts alone, peanuts and cornmeal, and cornmeal alone, were fed to determine their relative pork-producing value. At the close of the sixth week it was found that 2.8 lb. of peanuts alone, or 3.7 lb. of equal weights of peanuts and

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ADELAIDE CHEMICAL & FERTILIZER CO., LTD.,

CURRIE STREET, ADELAIDE.

cornmeal had been consumed for each pound of grain, while 10.7 lb. of cornmeal alone had been needed to make the same growth. On butchering the hogs used in the tests it was found that the peanuts had greatly softened the pork and lowered the melting point of the lard, and that this was not wholly corrected, even when the hogs were fed on corn exclusively for a month before slaughtering. Like other feeds rich in protein, peanuts are more valuable for growing animals than for those intended for immediate killing. The "Bulletin" says further: It is highly desirable to arrange a succession of peanut crops rather than to have large areas ripen at the same time, for, in wet weather, Spanish peanuts will not remain long in the ground after maturity without sprouting.

◆

Milking.

The operation of milking, if gently performed, is a pleasure to the cow. This pleasure promotes milk secretion, so it is not an absurdity to say that a good milker will get more milk from a cow at the same milking than an unskilful one could get, though each secured all that the udder would afford to him or her. The change from one milker to another is never made without some loss. Therefore where a large herd of cows have to be milked, and several milkers are employed, each milker should have assigned to him the cows he shall milk, instead of milking one or another indiscriminately. The cow will discriminate, even if the milker does not.

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Rye for Hay.

The cultivation of rye for hay has never assumed any great importance in Australia. Nevertheless, the cereal is a valuable ooe under many conditions, more especially in a dry season, while it is also useful as a means of getting rid of wild oats. The wild oat is a masterful plant, which stools well and takes up a large amount of room. Consequently, when it is prominent in a field there is so much less space for the wheat plants to develop, and a much smaller quantity of plant food available for their sustenance. The late Mr. W. Farrer, of Lambrigg, New South Wales, well known in connection with wheat-breeding experiments, found that the growth of rye for hay is an efficacious practice to adopt in cleaning fields infested with wild oats. His experience extended over several years, and when he first began to grow rye for hay wild oats were so abundant in the cultivation paddocks as to be a source of great trouble. But after he adopted the practice of feeding his farm horses on rye hay wild oats became less and less prominent, and eventually could hardly be found. The reason for the superiority of rye hay as a means of eradicating the wild oat pest over wheaten or oaten hay is that for rye hay to be good the crop has to be cut as soon as the earliest plants come into flower, and that period is before the wild oat plants in the crop have formed seed. There are therefore no seeds of the wild oat in good rye hay, and no seeding of the cultivation paddocks with wild oats is done by the working horses. An important advantage which is attached to the growing of rye for hay is that if the seed be sown early—say, about the end of February, but in no case later than the middle of March—the crop can be grazed during the winter months, and, if the stock be taken out early enough, a fairly good crop of hay will be produced afterwards. A second important advantage is that when working horses have rye to graze on in the winter and during spell days, much less hay is needed for their use, while the horses themselves are fresher and healthier than when they are getting dry feed alone.

◆

A boar is fit for service at the age of 12 months, but it is better to allow him to become a little older, say 18 months.

The feeding value of both maize and sorghum silage can be increased by adding some leguminous crop. The two crops may be sown separately and mixed while being cut into the silo, or grown and harvested together. The cow pea is probably the best crop for this purpose.

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POTATO DISEASES.
As a preventative to the spread of POTATO BLIGHT (Irish blight) SCAB, BROWN RUST, etc., Immerse all seed potatoes in SICKLE BRAND FORMALIN 1 lb. to 32 gallons water. Soak uncut tubers in the solution for 2 hours, spread out to dry, cut and plant as usual. It is important not to cut tubers before treatment.
PRICES:
1/6 per 1 lb. bottle, 14/- per gallon bottle, 12/6 per gal. in 3 gallon jars, 1 gallon — about 11½ lbs.
Sole Agents for South Australia:
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CURRIE STREET.

Selecting the Sire.

In horsebreeding base your selection more on the quality of the foals a horse is getting, than the individuality of the horse, for many first class show horses are but indifferent breeders. First consider the quality of the horse, then the size. Clean flat bone with silky hair. Pasterns of medium obliquity ending in a large hoof head which in turn expands into what a Scotchman calls a "foot like a tub" is what we want. Then, too, the constitution must be considered. A prominent breast, strong shoulders laid well into a deep chest, surmounted by a good crest. Strong loin muscles, a short back, deep, well sprung ribs should connect squarely formed, powerful croupe and haunches to the pleasing fore-quarters. Gaskin muscles should be prominent, while the hock should be strong, angular and free from any approach to puffiness. In action, a stallion should first of all be the embodiment of good spirits. His walk should be clean and sprightly. His trot should be expressive of control, square action in front, trappy action from the side, and carrying the hocks well together behind without any tendency to interfere.

◆

Lumpy Jaw.

"Old Subscriber" writes :—I am enclosing a photo of a cow which is suffering from a swollen throat. Can you tell me what the complaint is? At first there was a slight running at nose and mouth, this disappeared only to come on again and remain, she appears to suffer no discomfort to speak of and has not lost much condition, is rather loose internally, but feeds and drinks well. It is about two months since I first noticed the swelling. I should be much obliged if you can enlighten me as to cause, and remedy. Please reply through correspondence column in your journal and oblige."

We regret that you did not forward your name so that we might have communicated with you directly and immediately, as the matter is a serious one. The cow is suffering from Actinomycosis, commonly known as lumpy jaw or wooden tongue. Iodide of potassium in 4 to 8 drachm doses given daily is, we believe, the recognised treatment. If the tongue or mouth parts generally show signs of tumerous growths, these should be scraped daily and dressed with a mixture of iodine tincture, carbolic acid and glycerine. Iodine in any form is fatal to the fungus causing the disease. You should, however, obtain qualified veterinary advice without delay. The disease is contagious and the Stock Department inform us that in accordance with the Stock Diseases Act, you should at once report the case either to the nearest inspector or to the Chief Inspector, Adelaide. We advise your communicating at once. Isolate the beast without delay, for though present symptoms may not indicate any serious complaint the animal is dangerous to others with which it may come in contact. If in milk we should suggest your not using it, till receipt of advice from Department.

◆

FIBROUS CEILINGS

(From "Building.")

On the destruction of Her Majesty's Theatre, Sydney, by fire on Easter Sunday in 1902, the architect in rebuilding the theatre decided to instal Fibrous Plaster work throughout, on account of its well-known fire-resisting qualities. The whole of the ceilings throughout the vast auditorium, together with the beautiful box and circle fronts, the massive dome, and the famous proscenium were all constructed in Fibrous Plaster, and were considered the finest in the State. The foresight of the architect was amply demonstrated on the occasion of the second fire on Sunday, Aug. 1, 1909. Starting on the floor of the gallery, the flames quickly took possession of the woodwork, and spread rapidly till they reached the Fibrous Plaster Ceiling, which successfully resisted the terrific heat to such an extent that the battens behind the ceilings were not damaged, and remained in position for the new work. Subsequent examination demonstrated that the theatre was absolutely saved by the Fibrous Plaster Ceiling. No other ceiling material could have withstood the effect on the flames, and it speaks volumes for the fire-resisting qualities of the material. As an indication of the appreciation of the owners it may be mentioned that the architect had it re-instated exactly as before.

These ceilings are supplied by Mr. T. W. Ingham, Victoria Place, near Government Offices, from whom all information can be obtained.

C. H. LEHMANN

GRENFELL STREET, ADELAIDE.

CASH PRICE LIST.

SADDLES.—Gents—I claim to make and sell as good an article and Cheaper than any other House:—50/, 60/, 70/, 75/, 80/, 100/, 110/, 120/. For Silver Mounts add 5/. Racing Saddles, any weight, 50/, 60/, 70/, 80/, 90/, 100/. Exercising, 60/. 70/, 80/, 90/, 100/, 120/.

BRIDLES.—Good Useful Snaffle Bridles, 6/6, 9/6. Queensland, 8/6, 9/6, 10/6, 11/6, 12/6. Double Rein, 10/6, 12/6, 14/6, 16/, 18/. For Solid Nickel Bits add 3/, and Curb 4/6. Ladies' Double Rein same Price, only add for Round Reins, 3/, and Noseband, with Net, 2/6. Head-Stall Bridles, with Reins, strong 10/, 11/, 12/.

STRAPS.—Saddle Straps from 6/, doz.; Hobble Straps, 9d. 1/, each. Rings, 4d. 6d. good quality.

REINS, Single Cart, strong, 7/6, 8/6; Spring Cart 7/6, 8/6; Leading, 11/6 for 25 feet, 16/ for 36 feet; Cross Reins, strong, Waggon, 12/6, 13/6; Cross Reins, Buggy, Silver Buckles, best 14/6, 15/6. For folded hand parts add 6/ Bridle Reins, 2/6; Silver Buckles, 3/6.

HARNESS.—Carriage Harness for £15 up Best. Pair Horse, with pads, from £10 up. Pair Horse Ordinary Skeleton, Traces sewn in Hames, 120/. including Pole Straps; with Buckles in Hames, £6 10/, £7, £8, £9. Single Buggy or Trap Harness, you can have as low as £4 10/, but if you are wise don't go below £6, £6 10, £6 15, £7, £8, £9, £10 £11, £12. Best Value, and really a splendid line is £8. Spring Cart, with Square Saddle, £5 10/., £6, £6 10/, £7. Long Saddles, 5/ extra.

CART or DRAY HARNESS.—Saddles 22/6, 25/ and 27/6; Breeching same price 22/6, 25/ and 27/6; Shaft Belly Bands, 6/6, 7/6; Leading Belly-Bands, 3/, 3/6; Iron-cased Hames, 5/6, 6/6, 7/6, 8/6. (Really Good); Hame Straps 9/ per doz., or 10d. each; Cart Winkers, 8/6, 9/6; Patent, 10/6; Queensland Pattern, 11/6. Plough Backbands, 5/6, 6/6, Spiders, 7/6, 8/6; 9/6; Best Chains, 5d. 6d. lb.

COLLARS.—Faced with Hair, Best, 17/, and 18/; Leather Lining, 19/, 20/ Round, 17/; Faced with Hair, 18/; Spring Cart, 17/; Patent Leather, 20/, 22/6; Yankee Chaff 17/, 19/, 20/.

KANGAROO THONGS, good 1¼ yard, 1/; 1½ yard, 1/4; 1¾ yard, 1/8; 2 yards, 2/. 6 plait, 8 x 8, Stock Thongs, 6/6, 7/6, 8/6;

Really Good DANDY BRUSHES 2/, extra Large 2/6.

WHIP HANDLES, SPURS, CLOTHS ROPES, in fact every item you can mention in Saddlery.

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C. H. LEHMANN, Grenfell Street, Adelaide.

Poultry Notes.

Duck Breeding.

— Some Useful Information —

The breeding of ducks is coming into general favor among poultry keepers who have suitable premises and require quick maturing birds. Some seasonable information has been asked for by a young breeder who also wishes us to treat on the qualities of the Aylesbury. An English writer says :—

The house for a single pen of ducks need only be a few feet square, and may be as freely ventilated as desired, so that it is needless to be particular about stopping every crack in the walls ; the more air they have the better. The roof should be tight, however, and the chief requisite of all is a dry floor, as the birds get cramp very quickly if this is not attended to. The best floor for a duck house is concrete, sloping a little from the place where the birds sleep ; another good plan is to make a floor of slates raised two or three inches above the the ground, with half an inch of space between the slats. On the floor dry straw is laid, on which they sleep, and which must be renewed wholly or in part whenever it is found wet or dity. A few bricks on the floor make as good nests as anything, and some prefer none at all, the ducks laying in the loose straw. It is generally the best plan to shut laying ducks in the house till nine or ten o'clock in the morning (they usually ,lay early, and sometimes before light) as otherwise they are apt to lay away anywhere, or even in the water whilst swimming.

Though most of the ducklings raised for market, says Lewis Wright, have never entered water in their lives, breeding and exhibition stock require water, in which copulation often takes place, and without which the eggs are not fertile as a general rule, though "dry rearing in th United States has produced strains that breed satisfactorily, even if not allowed to swim, and some dry-reared ducks are found fertile in England also. Where there is good range over farm or garden, however, quite a small pond made of concrete, or by sinking an iron cistern in the ground, will suffice A pen of ducks thus kept is useful in a garden, eating many slugs and worms, and doing little damage if fenced away from strawberries of which they are specially fond. A foot of wire netting is quite sufficient to confine them anywhere, or a board stood up on its edge will do the same.

It is usual to mate three or four ducks to one drake, and the eggs are generally fertile, except that the first dozen eggs which a duck lays are very often not so. The birds are almost always peaceable, and several pens will agree perfectly well together. With good range, stock birds do not require much feeding, as they pick up a great deal in the water in the shape of small mollusses, animalculae and weed, and also from the ground in the way of snails, slugs and worms ; in such circumstances a little meal in the morning and in the evening will suffice. When kept in smaller space more food is required, and amongst this a portion of animal food is absolutely necessary, far more so than in the case of fowls, as nature intends them to obtain a great deal of this description of food, and without it they cannot thrive, much less keep up a supply of eggs. Plenty of grit must also be provided in such circumstances, some being also placed in the trough of water.

A few ducks may be kept with profit, either as providers of eggs or of young birds. Where duclings are chiefly valued, the Aylesbury or Pekin will generally pay best, or a cross between the two ; where eggs are most desired Pekins or Indian Runners of good strains will lay as many eggs in a year as the laying breeds of fowl's or one of the Campbell varieties will be useful. The young are much more easily reared than chickens, having unfailing appetities, and growing much faster,so that they are eatable at a much earlier age. The eggs are much better set under hens as a rule, and if the duck be placed in a pen by herself for a few days, her broody fit will go off and she will soon lay again. It should be mentioned that duck eggs are very often covered with a sort of slime when laid (sometimes of quite a different color from the shell beneath), which, if left on, sometimes hardens the shell so much as to hinder hatching ; if this is apparent it should be wiped off, either at once, or before incubation where the eggs are intended for that purpose.

If a cosy house and bedding be provided for the night, one hen can look after a very large brood, the ducklings keeping themselves warm with much less brooding in comparison than chickens. They are generally fed mainly on one part of chopped boiled egg mixed with two parts of stale bread crumbs, for the first five or six days, giving the food on a board about every two hours, and adding twice daily some green vegetables or weed chopped, or of lettuce which they prefer to anyting else. A sod of turf may be placed in front of the coop when there is no grass run, of which they will swallow a great deal of the earthy part as well as of the green. Later on coarse grit may be supplied, as for the old birds. After a few days the egg and bread may be replaced by barley meal, with which must be mixed a fair portion of some animal food—it matters little what—soaked dry meat or crissel, boiled greaves chopped up, horse flesh, or any wholesome butcher's refuse, or a portion of fresh cut bone—any of these will suffice ; but, as already explained, a fair proportion of such food is absoluteiy necessary for rearing fine or healthy ducklings. At a month old the five or six daily feeds may come down to four, and at six or seven weeks to three, leaving, however, in their sleeping place, but not near their bed, some grain in a shallow pan of water. They will thrive just as well if not better hatched in an incubator and reared in a brooder ; but food must on no account be given in the inner chamber, which, must be kept clean and dry.

A few ducklings may be reared even for exhibition in quite a small space if it includes an exercise yard, and a small pond. The best time for hatching exhibition stock is March or April. Those which promise best, either for this purpose or as breeding stock, should be picked out when a few weeks old, kept specially clean and dry at night, and given all the exercise possible, feeding mainly for frame, with nitrogenous food, and after three weeks old allowing them to dabble in a large tin of water kept inside, if the pond outside is too cold. The remainder which are only destined for table, may be kept penned up, and forced on with more fattening diet, on the same principles as described presently in connection with larger undertakings. Care must be taken to keep all out of the hot sun, which produces in ducklings a kind of sunstroke or heat apoplexy, and kills many if exposed to it, besides

(Continued on page 376).

Some of the Merits in Dry Feeding.

Although dry feeding is no new idea to the poultry world, it is only of recent years that the subject has had consideration. Twenty years ago Drevenstedt was a strong champion of this system, but at that date poultrymen would not take kindly to the dry mash grain system. Cooked food, fed warm, seemed to be the proper trick; to-day, dry mash in the troughs, raw vegetables and good hard grain are in favor with many.

Of what benefit are these changes in the diet? The matter, says an American writer, has been carefully tested, and it is now held that dry food is far superior for several reasons; First, after becoming used to it, the fowls prefer the ground grain to that which has been cooked or steamed. Second, it is a labor saving plan. Third, it keeps fowls in a more healthful condition.

Let us go a little deeper into the subject. For a while after you begin putting the dry ground grain and meat scraps into a trough for the fowls to help themselves they do not take very kindly to it. They pick out the meat, and then the corn meal, and some prefer the bran, but the fine stuff like middlings is left untouched. Gradually the fowls go to eating more and more until they soon eagerly clean up all that is in the trough, and after becoming accustomed to a dry mash it is surprising how much of the wet mash they will leave untouched in the troughs.

It is wonderful the amount of labor that is saved by this new method. In the time that it took to heat the water and mix up the morning breakfast, you now go along from pen to pen with a bucketful of dry feed in one hand and a watering pot in the other, performing the two duties of giving food and drink at the same time. As yet I have not tried the hopper way of feeding, but have in mind a feeder that can be closed up at night to prevent mice and rats from having a feast while the fowls are asleep. There are hoppers having three partitions, and one of the compartments thus provided is supposed to contain meat scraps. Thus these scraps are always before the fowls so that they can help themselves at will. At first it would seem that they would eat too much meat and, while they will at the start consume a considerable amount, they soon get to gauging themselves, and will eat on more than they need.

Now, I am sure dry feeding will be found much better and more healthful for the fowls. There is less chance of developing cases of bowel trouble than when feeding with mash, especially if the latter is too moist. During hot weather wet mashes sour very quickly, and all uneaten food must be removed from the troughs about an hour after feeding. With the dry mash this is not necessary. For young chicks the dry mash is especially recommended as this system means much hardier stock. They eat a few mouthfuls, then take a swallow of water and scamper off for a run. In a few moments they return and repeat the dose. They never gorge themselves in this way. At night an allowance of food is placed in little troughs so that the youngsters can help themselves at break of day. Nothing will give a chick a worse setback than to be found pining for food. A hen is not so apt to overfatten if she is given dry mash. She does not eat so greedily as she does wet food, and the fact that she eats a little at a time and returns often to the troughs gives her a better chance to properly assimulate her food.

The proper way of feeding the mash to laying hens or to growing chicks is that of strewing in straw or other light litter so that the fowls are compelled to scrktch for it. They must have exercise. It should be given an hour or more before roosting so that the fowls will have plenty of time to hunt. If fed in a scratching shed attached to the roosting pen, and the fowls have free access to it, they will get off their perches at the break of day and scratch and work hard until the attendant comes out to give them their breakfast.—"The Leader."

Hints for Breeders.

After it is six weeks old a turkey is stronger, and stands a better chance to mature than does a chick. But these first six weeks are the ones of greatest caretaking if the poults are to survive.

Remember the first few days of the young turkeys' life they are prone to not only run after their shadow, but any moving object coming within their notice. Yhe novice especially should remember this, and not be startled at this action of young turkey poults. The veteran breeders are aware of this particular peculiarity of young turkeys, and keep them closely confined for a few days with their natural mother, so as to teach them her voice, and prevent them from becoming confused by the calls of the other barn yard fowls. If the mother and poults are not dealt with intelligently at hatching time there is sure to be more or less mortality among them. As a rule turkey eggs are fertile; frequently every egg hatches, causing overcrowding in the nest.

Duck raising is the easiest and most successful branch of the poul-

KOONOOWARRA POULTRY YARDS.

Barred Plymouth Rocks: Special Exhibition pen. Ckl, 1st and Sp. at Victoria P. & K. C. Show; 1st and Medal Essendon Show, Vic.; 1st and Sp. Adelaide P. & K. Club Show, 1911; Hens and Pullets, all winners, P. & K. C. Show, Adelaide, 1911. A limited number of settings only. £2 2s. per setting.; Good Utility, £1 1s.

Buff Orpingtons: Birds have won prizes whenever exhibited. Good sound color and healthy stock, also good winter layers and splendid birds for Export trade. 10s. 6d. and £1 1s. setting.

White Leghorns: My Roseworthy pen averaged 220 eggs per hen, and are now mated to cockerels of well-known laying strain. 7s. 6d. per setting

White Plymouth Rocks: Snow-white birds, easy to breed and rear, typical Farmer's fowl, good Winter Layers and excellent Table Birds. A few settings only to spare at £1 1s.

White Orpingtons: Imported and prize-winning stock. Won 1st Ckl, 1st Pullet Royal Show, Adelaide, September, 1910. Great Winter Layers and good Table Birds. 10s. 6d. and £1 1s. setting.

Pekin Ducks: Never beaten in show pen. Four Firsts, 1 Second, 2 Sp' at P. & K. Club Show, Adelaide, 1911, out of five entries. Two Firsts, 1 Second and Special at Royal A. & H. Show, Adeleide, Sept. 1910, out of three entries. A limited number of Settings at £2 2s. Good Table Birds, specially mated, suitable for Export trade, 5s. per setting. Reduction for quantities.

Eggs securely packed and delivered on Rail or Coach (buyer pays carriage). All Eggs Stamped Koonoowarra. Infertiles replaced once.
Terms: Cash with Order. I keep nothing but A1 Stock. I cull heavily and breed only from the Best.

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try business, giving quick return for the money and time expended, and it seems strange that more farmers do not raise large flocks of ducks every year. Ducks can be made to weigh 5lb. each in ten weeks from the time they are hatched, and they eat the waste products of the farm.

The idea that one cannot raise a flock of ducks without a stream of water on the farm is all a mistake, as they really need water only to drink, like any other fowls. Of course they enjoy water to swim in, but it is not essential to their health, and is detrimental to young ones.

A nervous hen should never be entrusted to incubate turkey eggs. Only the very quietest hens should be used. The poults being very tender, it is next to an impossibility to save them when hatched, under nervous hens.

A good supply of growing onions, peas and rape makes cheap feed for the ducks, and if they can range over the plot where these plants are grown they may feed at will and save time for the caretaker. If this is not practicable the green stuff must be cut in short lengths.

Plenty of water must always be at hand for ducks to drink, in vessels deep enough for them to bury their bills in it; this keeps the nostrils clean, which is very essential. In feeding mashes they eat so ravenously that water must be at hand to wash down every "mouthful." In feeding grain it is best to put it in a dish or trough of water so they have to "fish" for it, and are thus compelled to eat more slowly.

Ducks require the simplest shelter, and can be housed very inexpensively. Five or six may easily use a tight, large dry-goods box for their sleeping quarters, with the open end protected.

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Poultry Notes.

While there is no good reason why the farmers should not have as good poultry as the fancier, and of all kinds, at the same time it is very questionable if it is good policy to have more than one kind. Usually the farmer expects to give the poultry the range of the farm. In doing this it costs less to keep them, as a considerable part of what they pick up would otherwise be wasted, and in doing this they will also destroy a large number of insects that if let alone would seriously injure the growing crops. If more than one breed is kept, they would have to be kept separate, and in doing this usually one or the other would be confined at least a portion of the time, and there is a risk of their getting together.

To the experienced eye the roughish or granulated surface of the perfectly fresh egg distinguishes it at once from the more shiny or polished surface of the one that has been under the hen a day or two. We can pick out every fresh egg among a nestful of those that have been sat on two days, even in the dark. The secret is very simple. Just scratch over the surface with the fingernail; if it grates the egg is fresh, but if the nail slides smoothly it is old. A little practice makes this a sure test.

The feed trough, or rather the feed hopper, that is kept full of food is the lazy man's method of feeding, and it is not only expensive, because it induces the hens to eat at all hours of the day, but it causes them to fatten and be subject to disease, thus diminishing the supply of eggs. When feeding the hens with grain, let it be scattered wide, which not only prevents the greedy hens from securing more than their share, but compels all to hunt for it, there by taking exercise and remaining in better condition for laying.

Four weeks or more are required for hatching guineas, and, unlike other chicks, the little guineas break the shell nearly every one at the same time. They are all hungry, too, and before the down is dry begin pecking at each other's eyes and feet, and trying to swallow tiny bits of eggshell. They are sprightly little things and about the prettiest of all young fowls, but until well feathered are very tender and delicate.

If hatching with your own eggs much depends upon the question whether the old birds were in good condition all last winter. That often largely controls the hatching of eggs and the stamina of the chicks that may be obtained. For the good of future generations of chickens, keep the old birds in a thrifty condition the year round. A chick's constitution is made before the egg that hatches it is laid. Any handicap that the chick may start with will be recovered from very slowly. Good care for poultry all the time should be the rule if good hatches or hardy chicks are hoped for.

How shall chicks with great vitality be secured? In the first place by keeping and feeding hens in such a way as to give them the greatest amount of muscle and muscular energy, which means that powerful heart muscles will be developed. If these hens are compelled to exercise they will be able to produce eggs that will have in them the elements of nutriments and energy that will develop into chicks of powerful vitality. We do not believe that chicks of great vitality can be developed from eggs laid by hens that have been pampered on fatty foods and deprived of exercise.

Costly errors are often made in careless methods. One cannot give the poultry business too close attention. This is particularly so in the matter of feeding. Beginners are apt to be irregular in this. They do not have any set hour. The stock will soon learn to know when their feeding hour arrives, and will be in a more or less anxious state until they are fed.

K. BECHTEL,

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Patent Attachable and Detachable Buggy, Spring Cart, Yankee, and Cab Saddles.

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LADY IN ATTENDANCE.

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have twice won Roseworthy Egg-laying Competition.
World's Record for placing the first five pens in Blenheim Competition 1906-7, 100 pens competing.

I am offering eggs from Roseworthy winners at a very low figure to the first 20 applicants. This pen beat all Australasian Competitions held in open yards for 1908-9.

High class stock and eggs in season satisfaction guaranteed.
Telegrams—"Ontario."

T. B. BROOKS - - Clarendon.

(Continued from page 373).

spoiling the bill in the case of Aylesburys. They also catch cold and cramp readily, if left out in a shower of rain before they are fledged, or allowed in cold water too early. In nature, the duck takes them to water at once, and the skin at once gets hardened to it; but with a hen or incubator, and at earlier seasons, this is not so, and they get chilled.

The bills of Aylesbury ducks kept for exhibition require much care. If a bird with the best of bills is allowed to grub about in filthy places after the manner of its tribe, and be shut up at night uncleansed, a very few days will discolour it; and a very few days of hot sun will tan it perceptibly yellow. Show birds should only be let out for an hour or two in morning and evening, though the breeders must have liberty even at the cost of tanning their bills, or the eggs will fail. The houses must be kept clean, and a pan of sharp, white gravel and water always kept in it, with some wheat to induce them to scour in it freely. A young bill is thus kept in order, but with age a coarse, horny substance forms upon it, especially on a bird with much liberty. Before exhibition this is very carefully pared away with a sharp knife, taking care not to trench upon the inner skin or make it bleed. The bill is then smoothed with fine sandpaper, and the duck kept in a darkish house or pen for two or three weeks, with the gravel and wheat abovementioned. This will bring out a really good bill nearly as fresh as ever. The bills of other varieties sometimes need similar attention, though in less degree.

The special economic merits of the Aylesbury duck are its size, its hardiness in all climates, and, above all, its rapid and early maturity. Owing to this quality of quick and early growth, many are marketed at eight weeks old, and some weigh as much as 4lb. at that age. The white feathers are also of more value than colored ones. The color of the eggs varies. Most generally they are rather long and pointed, and white, of a peculiarly pearly or transparent quality, but others are green, and the same duck will lay eggs of one color and then of the other. Cream colored eggs are also not at all uncommon. The eggs are thought by many more delicate in flavor than those of other breeds. The ducklings when hatched are a light primrose yellow.

The domestic varieties of ducks are much more numerous than in 1861. when Mrs. Fergusson Blair wrote in "The Henwife" that "there is not a great variety in our domestic ducks; only three distinct exhibition breeds exist, viz., the Aylesbury, Rouen, and Buenos Ayres or East Indian."

Though, curiously enough, the last named has now practically disappeared, being replaced by the Cayuga, the list now would be twice as long; but the first place, at least in England, must still be given to the Aylesbury breed, named from the country town of Bucks, which has for generations been the chief, and is still the largest, centre of the duck rearing industry, and where scarcely any other kind of duck is thought of in connection with it.

The Aylesbury duck is long in the body, which is carried horizontally, the legs appearing almost in the middle. The neck is fine and rather long, with a somewhat swan-like carriage, the head a little snaky, with the bill long and coming out straight like a woodcock's. The most obvious characteristics to catch the eye are the pure and spotless white of the plumage, entirely free from the least yellow, which may contaminate Pekin-crossed birds, and the delicate color of the bill, which should be a soft pink, "like that of a lady's finger nail." This color is partly the result of long and careful breeding; but there appears little doubt that it is partly due also to constant scouring in a fine shelly gravel found throughout the Vale of Aylesbury about the streams and ponds, of which the ducks are very fond; and it is only found in perfection when the birds are kept out of much sun, and away from ferruginous soil or foul water, which injures the color greatly. Left to wander at pleasure in other localities, the progeny of the best stock will often turn yellow in the bill, but it is found that this can be prevented by care, and by placing in their troughs abundance of white sharp gravel. The legs are bright orange. The drake differs in no respect from the ducks, except in being rather larger, and having two or three curled feathers in his tail; and at an early age it is difficult to distinguish the sexes, as these male feathers do not develop till the first moult. As the young ones grow to the age of six or eight weeks, however, the voice of the two sexes will be found to differ, the ducks giving a "quack," whilst the note of the drake is not a quack at all, but much fainter, and husky in character.

In one respect the Aylesbury duck has somewhat changed during recent years. As we remember it in 1860, and for some years afterwards, it was not what duck breeders term "keeled" underneath the body. By degrees this character was more and more cultivated, from a desire to increase the massive look of the birds, and at the present day the Standard describes and requires keel—the term is self-explanatory—in exhibition birds. To a certain

THE DIFFERENCE IS JUST THIS: WHEN YOU USE

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YOU SAVE YOUR MONEY.

WHEN YOU USE A SUBSTITUTE THE OTHER MAN SAVES YOUR MONEY.

DON'T LET HIM HAVE IT.

moderate extent, while confined to a fairly deep breast bone, the point is useful; but the present exaggerated keel is disliked by market. The average weight of good stock is about 7 lb. for drakes and 6 lb. for ducks, in ordinary condition at twelve months old; and such weights, if of large frame, are quite large enough to breed from. The heavy weights of 10 lb. and 9 lb. seen at exhibitions are obtained by forcing diet; and birds once fed and fattened up to it are practically worthless as breeding stock after. As if that were not enough, both these and other ducks are often crammed before judging, or tempted to eat a pound or more of raw sausages, or meat; or some exhibitors even provide a quantity of live worms. Some ducks have been killed in this way, but a moderate quantity of uncooked sausage, or something of the same kind, often seems to pick up the birds and make them look better in every way after the journey. "Leader"

* * *

Preparing for the Winter Egg Supply.

Hens over two years old should be liberally fed, so as to induce continued laying and postpone the moult. It is a good plan to increase the proportion of bran in mash, as heavy feeding, unless with food of a highly nitrogenous nature, has a tendency to induce broodiness, and this brings on the moult very speedily. It does not matter if the birds get fat; this will be all the better when they are for sale, so soft food may be freely used. When the moult begins, the birds must be sold at once—that is, when the first sign of pin-feathers is noticed on the breast; new feathers on the cushion may be found at any time of the year, but a hen never shows them on her breast unless she is moulting.

Year-old hens require entirely different treatment; they should be, if possible, placed away from the older fowls, and fed in the most sparing manner—this is to stop laying. When on open range, a very small handful of wheat or other grain once a day will be quite sufficient, and the birds should be in moult in a short time. Some poultry keepers shut their young hens into a warm house, crowding them closely, in some cases, to make them warm, and almost starve them to force a moult. This method is certainly rapid, and gets the birds ready for winter laying in a wonderful way, but a more natural moult in the open is to be preferred, especially for the breeding stock. Once the growth of new feathers has really begun, it must be borne in mind that there is an added drain on the fowl's system, greater than that caused by egg production, and the food must be good, and be liberally supplied. A little linseed will be found a help, barley-meal is also said to be useful; but any good mixture of meals can be given. Care must, however, be taken not to get the hens into a fat condition; and to avoid this danger maize must be used with caution, and never as the only diet. If it is used freely in early autumn, its value as a winter egg-producer is very considerably lessened. Birds that have had little or none of it during summer and early autumn usually respond to its stimulating effects in cold weather while birds that have had it fed to them year in and year out never exhibit this peculiarity. This hint may be of value to those who have not hitherto made it a rule to vary their rations for their birds according to the season.

July hatched birds are now filling the egg baskets, and will be keeping up the supply when the older birds fail. Such early pullets, however, are seldom the most profitable except for those who have contracts to fill, and find it hard to keep up the supply in early Autumn.

August hatched pullets are already looking red and "singing," and some of them have started laying. It is a difficult matter keeping back some of the more precocious of these youngsters, but it should be done or their eggs will certainly be small and the birds themselves stunted in growth. To retard laying, a change of quarters is a good plan, and spare feeding an absolute necessity. No meat, cut bone, or anything of such nature may be given, plain food with plenty of vegetable and green food being the rule. No pullet should be allowed to lay under six months old, and if she can be kept back until seven months it will be all the better; the later they begin to lay, the better chance there is of having them continue through the winter.

The later birds need abundant feeding, and may get three meals per day to push them on to maturity before the cold weather arrives. With those later broods the cockerels and pullets should be separated early, and if this has been neglected, it is better done now than not at all. The cockerels grow to a greater size and make finer and better stock birds if kept entirely apart from the pullets until they are fully grown. It is, however, with the care of the pullets we are most concerned, as on their proper treatment will depend the winter egg supply; consequently, every effort should be made to bring them into the finest possible condition by the first of April.

If these hints are put into practice, there should be a constant supply of eggs throughout the winter months, and we should hear less of the difficulty of procuring really new-laid eggs. Constant attention is required from the moment the chickens leave the shell until they come into profit, and there is a good deal of consolation in the fact that this is never labour thrown away—it brings its reward in the form of hard cash.

WATCHMAKERS, JEWELLERS and OPTICIANS.

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Is by far the best Cold Safe on the market. Is guaranteed to keep Milk Sweet and Butter hard for days in the hottest weather. It is also excellent for keeping Meat better than ice chest and no ice is required.

E. E. CRAIG,
OXFORD STREET, HACKNEY.

The Blue Andalusian Fowl.

Among the many varieties of poultry which are worthy of attention on the part of farmers, there is none more highly to be recommended, both for general utility and for handsome appearance, than the blue Andalusian. Strictly speaking, it is not blue but blue-laced, and the sight of a number of these birds together upon a farm is one calculated to inspire the outsider with enthusiasm for poultry in general, and for this breed in particular. Farmers might just as well try to make a show of high breeding in their poultry as in their other stock, and the effects of doing so cannot fail in the long run to act as an advertisement, which will bring profit in due course. You must be, or do something out of the ordinary in these present times of competition, and it is by no means a hard task to earn a reputation by keeping a class of stock that will command favourable notice and comment.

— General Description and Qualities.—

The Andalusisan belongs to the Mediterranean classes of poultry; it is one of the long-combed varieties. From this two things follow as a natural result—the first, that it is a prolific layer, and the second that it lays white eggs. I do not propose to say anything here about the disadvantage of keeping layers of white eggs. A pure white egg, in my own experience, is more saleable than a pale, tinted brown egg, and when a basket of average Andalusian eggs is set side by side with another basket of assorted farm eggs for sale, the intending purchaser does not hesitate long before making choice of the former for preference. But apart from this the farmer who is resolved that he must have brown eggs will find the Andalusian a wonderful bird to cross with other breeds in order to produce winter layers. Indeed, if this crossing be managed wisely, a better result will be obtained from the utility point of view than even with the Andalusian alone. I will therefore deal specially with the subject of crossing Andalusians, but before doing so I will finish what I have to say about the pure variety. Being a long-combed bird, it is essentially a summer layer. All long-combed varieties are the same. They do not lay well during the winter, because their combs are liable to become frosted, and this makes them miserable and mopy. Of course, if they are kept in a warm sheltered place they do not suffer in this way, and I know plenty of poultry farms upon which the Andalusian is being kept, and where it lays all the year round, never ceasing, in fact, except during the late summer and early autumn while the moult is on. The Andalusian is a non-sitter, but like all non-sitter varieties if kept mixed up with other breeds given to sitting, she is liable to take the contagion, and then will "better the instruction"—at least, so far as obstinate persistence is concerned—though not to be relied upon as a sitter in the slightest degree, for she will fly wildly off the nest at the first approach of her owner, and would certainly smash by her insane conduct, any eggs entrusted to her to incubate. Farmers who keep Andalusians for egg production, therefor should keep them by themselves, as the habit of becoming broody is one that greatly interferes with the regularity of a hen's laying, and brings down the superiority of a non-sitter in this respect to the level of the most persistent old feather-legged brooder that inhabits the average poultry yard.

— Points of the Breed. —

Now a few words in regard to the points and type of the good-quality Andalusian, with a hint or two upon breeding. As is the case with all prolific breeds, these birds are very active in their habits, and hardy withal. Ten or a dozen hens may be run with one vigorous second-year cock, and practically all the eggs will be fertile. The chickens grow and feather rapidly, and mature early (like the Leghorn), many being ready to lay at the age of five months, and even earlier in some cases. They do not, curiously enough, breed very true to colour. One almost always gets a number of white chickens, and frequently some black ones; the whites are almost invariably splashed with black or blue feathers. The explanation of this irregularity in breeding probably is that as the blue colour has originally been derived from a crossing of black with white, the ancestry shows itself again and again. These mis-coloured birds when breeding do not, as a rule, repeat their own defect, but breed fairly true, and in all other respects their points are quite up to standard. The most important show point in an Andalusian is, of course, the lacing, and it is that which gives a perfect specimen the real beauty which is the pride of a fancier. In shape and general conformation it resembles the Minorca and the Leghorn, but the comb has not yet been cultivated to the same extent as in the case of the two last-named varieties. The average farmer will not, of course, trouble himself much about showpoints, and my only reason for referring to them is this, that when it comes to making a choice out of a number of birds which to purchase or which to keep, one might just as well choose the standard sort. In choosing pullets for laying, select those which are largest and best grown, not too long in the leg, and showing the best contour in the hind-quarters (indicative of the fullest development of the reproductive organs). The darker the colour, and the more regular the lacing on the breast, the better the type of chicken likely to be produced from the parent bird. In order to check the throwing of mismarked chickens, the only thing to do is to discover, if possible, which hen's eggs they come from, and get rid of her. The darker the parent bird, the less likelihood there is of her chickens coming out in wrong colours.—"Poultry."

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The temperature of a fowl's body is much greater than that of the human body. Therefore, when the weather is hot they feel it severely, and many die when no attention is paid to their requirements.

Eggs! Eggs!

Sittings from Heavy Laying

White Leghorns
Black Leghorns
Black Orpingtons
Silver Wyandottes

15 Eggs to each setting. Guaranteed fertile or replaced. 10/6 per setting.

T. E. YELLAND,
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INCUBATORS AND BROODERS, **Simplex, awarded first price (silver medal) Adelaide Exhibition, 1910. Agent for Cort's Patent Cooler-safe, a boon in summer. Send for price list.**—D. LANYON, Manufacturer, 46 North Terrace, Kent Town. 6-12.

TICK

South Australian poultry owners have found that the very best remedy for the TICK CURSE is

Faulding's Phenytas.

Periodically dip the infested birds and spray infested houses and runs with Faulding's Phenytas and there will be no further fear of tick.

FAULDING'S PHENYTAS is Absolute DEATH TO THE TICK

Pigeon Notes.

The English Dragoon

(By Mr. Creer.)

This breed according to English writers and judging by the number that are shown, is the most popular breed at the present time in England. On looking through a 1910 Crystal Palace show catalogue I find there were over 500 Dragoons as against 440, the next largest class, which were Jacobins. Dragoons were indeed the largest class in the show, inclusive of the poultry division. First class specimens bring really big prices, £100 a pair not being an uncommon figure and further to emphasise the standing of the Dragoon in England I may state that the Dragoon Club gave a seventy-five guinea Gold Cup for the best Dragoon in the above show also five other cups, seven gold medals, and two silver medals. Now to get on to what I have to say of the bird itself. I do not want to dwell too much on the standard as it can be read in any pigeon book. The Dragoon is in disposition rather a quiet bird, unlike the Carrier he can be made very tame. I have them so tame that they will fly on my arm and eat out of my head. He is also a very sensible bird and will not uselessly fly against the wire of the house or knock himself about in a cage, but if you leave the door open for a moment, of course he is off like a shot. The Dragoon is a prolific breeder and the best of feeders and very healthy and strong. It is a hard matter to say which colour should go on top in this variety. Most writers agree that the Blue takes pride of place and I think as Dragoons stand at present this is correct, but I might add that if a Grizzle is as good in structural points, he should be preferred on account of the colour difficulty, it being as you know, the hardest colour to breed true. The Gold Cup at the Crystal Palace for best Dragoon has in turn been won by Blue, Blue Checkers, Silvers, Silver Checkers, and Grizzles, so you can see, it is a hard matter to say which colour is best. Now for a little bit about Dragoon properties. First the standard Colours are Blues, Blue Checkers, Red Checkers, Silver Checkers, Yellow Checkers, Grizzles, Mealies, Silvers, Yellows, Reds and Whites. The Dragoon should be even in all properties; excessive in none. In saying this we cover a lot of ground in Dragoon breeding. To start at the top. The skull has many peculiar properties and a good skull is highly valued. To begin with, seen from the top it should be wedge shaped wide at the back and gradually narrowing to the front, viewed sideways it should present a slight and even curve from behind the wattle to back of head, being at its highest just above the eye; from eye to eye the skull should be slightly curved; the cheeks slightly rounded, not flat like the Carrier; the distance from centre of eye to back of skull $\frac{7}{8}$ of an inch. The beak should be stout and boxed and blunt at the end and should measure from centre of eye to tip $1\frac{5}{8}$ inches. The lower mandible free from jew wattle. The colour of beak in Blues, Blue Chequers, Red Chequers, Grizzles and Mealies, jet black. In Silvers and Silver Chequers, a dark horn colour. In Reds, Yellows, and Whites, a natural flesh colour. The beak wattle should be peg shaped, high and wide at back, gradually sloping off to nothing and joining the beak smoothly about $\frac{3}{8}$ of an inch from the tip. The colour of eye is a very important point. It should in Blue, Blue Chequers, Grizzles, Red Checkers, Mealies, Silvers and Silver Checkers be a rich ruby red, in Yellows and Reds an orange red and in Whites dark or bull. The eye cere is also important for it puts a grand finish on a bird, it should be, in Blue, Blue Checkers, Grizzles, Red Checkers, and Mealies, a dark purple grey or damson. In Yellows, Reds, and Whites flesh colour, not pink. The neck should be of medium length and thickness entirely free from gullet, widening boldly from head and should not appear to join the shoulders suddenly. The shoulders should be thick, strong, muscular and prominent but not standing out from the body too conspicuously. The body should be broad across the shoulders and flat. The back should taper off from the shoulders to the rump and tail thus retaining the wedge shape of the body as in the skull. The tail should be moderate in length, projecting about $\frac{5}{8}$ of an inch beyond the ends of the flights and carried clear of the ground.

A dragoon should, in fact, must be short in feather to give it the desired upright carriage. The legs are more important than one might think, they should be thick, short and well set back. Carriage must be erect and bold, the ideal Dragoon being blocky or cobby throughout not racey. In breeding Dragoons, attend first to structural perfection. First horizontal outlook, which means correct beak setting, enabling a bird to carry his beak horizontally and in a line with his eye. Next comes formation of skull, which means a good sweep from behind the wattle to back of head with the correct width and wedge shape. Eye colour and colour of cere are, as already noted, most important. They take some getting and when once possessed in a strain these points should be well looked after. By far the best way to breed is to mate an old cock with a young hen or vice versa as mating two old birds gives you large fleshy wattles and eye ceres in the stock, whilst with two young birds you get both wattle and eye cere small. In conclusion I would earnestly advise beginners to always keep to one strain, do not chop and change about.

WOODWARD & MEAD
PIGEON SPECIALISTS,
Have bred some sweet 1910 youngsters
in
MAGPIES, JACOBINS, HOMERS,
NUNS.
Prices to suit all purses.
G. J. MEAD,
"Chiltern," Sycamore Grove,
BALACLAVA, Victoria.

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The Housing of Pigeons.

On this important point Richard Woods, the well known Dragoon Fancier, once wrote :—

"No experienced fancier would dream of housing the comparatively delicate short-faced Tumbler in quarters that would be considered the beau ideal of a house for the Dragoon.

To more clearly express my views I will divide the sort of accommodation I suggest into four classes thus :—

A. For Carriers, Barbs, Jacobins, and English Owls.

B. For Pouters, Trumpeters, and Fantails.

C. For Tumblers, Turbits, African Owls, Nuns, Orientals and Magpies.

D. For Dragoons and Antwerps.

The Varieties scheduled under the letter A cannot be kept in perfect health and vigour unless they are provided with access to outer flights, and a fair amount of exposure to the beneficial influences of the weather; for instance, if kept in close confinement the eye wattle of the Carrier would soon become sickly looking, soft and flabby. The Barb would lose that ruddy appearance of the eye cere, so much admired in this variety. The Jacobin would be speedily "abroad" in feather, and the sprightly Owl would soon develop into a woebegone appearance.

B. It will readily be seen that Pouters, Trumpeters, and Fantails, which are classed under B, if exposed to the influences of the weather, would rapidly deteriorate, in those essential properties that the ardent fanciers strives to produce and maintain. These should be kept in small covered lofts, admitting as much light, fresh air, and sunshine as possible,

C embraces numerous varieties that may be kept under similar treatment and conditions, these being a good roomy loft, to which should be added a large and covered flight.

D. Dragoons and Antwerps thrive better with more exposure than would be good for most varieties. The aviaries for these birds should, therefore, be considered with the idea of keeping these birds as much exposed to the weather as possible, i.e., the "house" should be much smaller than the flights. The flights, indeed, should be as large as possible.

S.A. Canary and Pigeon Society.

YOUNG BIRD SHOW.

Mr. C. W. Creer kindly sends the following report of the first Young Bird Show held by his society on Saturday, December 9th. "Entries were very satisfactory, and good quality was apparent throughout. The Canaries though few in number included some excellent youngsters. Old fanciers present expressed the opinion that they were the best lot seen out for some time. Pigeons were well represented, there being some big classes. Working Homers with twelve entries were most numerous, followed by Dragoons with eleven. Birds worthy of special mention were the winners in Dragoons, Magpies, Turbits Fantails and African Owls. Only a few Bantams were penned, but they were first-class in quality. The judging was in the capable hands of Messrs. J. A. Chas. von Einem and T. Koerner for pigeons, and Mr. F. W. Hocart for canaries. The following is the prize list with the judge's remarks :—

— Canaries. —

Crested—1, 2, 3, Clarkson and Marshall.

Crest-bred—1, W. W. Stally ; 2 and 3, H. R. Hammer.

— Novice Class. —

Crested—1, R. Spinkston.

Crest-bred—1, 2, R. Spinkston. A good lot all round.

— Pigeons. —

Pouters—1, 2, Hall and Porter. Too young.

Carrier.—1, 2, H. H. F. Miller. Very promising birds.

Dragoons—1, 2, C. W. Creer ; 3, J. Laing & Son. Very good ; strong class.

Working Homers — 1, 2, T. O'Lochlin ; 3, H. L. Chase. Strong in numbers ; good quality ; competition was strong.

Jacobins—1, Hall & Porter. Competition poor ; winner a good bird.

Magpies—1, 2, 3, T. Koerner. Very good, will be heard of later.

Fantails—1, 2, 3, D. Hayward. Winner stands right out from others, fine tail.

Turbits — 1, 2, T. Koerner. Two very good birds.

Blondinettes—No prize awarded.

African Owl—1, 2, A. E. Miller ; 3, J. Martin. Very promising birds, second loses to winner in gullet, but has wonderfully good skull formation ; third nice young black with good sweep of skull.

Any other variety—1, 2, J. Martin.

— Bantams. —

Game — 1, 2, 2, D. Cruickshanks. Three very good birds, will be heard of again.

Young bird shows will also be held this month and in February on the second Saturday in each month.

Entries close for the January fixture on Friday evening, January 6th, at the Selborne Hotel in Pirie Street, Adelaide.

What is a Champion?

To the Editor.

Dear Sir,—In answer to letters from A. E. Grosser and "Rambler" re Short-faced Tumblers, I would first, like to know whether I am dealing with one or two persons ; if the former, it is certainly one way of securing two apparently independent opinions, but not a way that appeals to everybody. I will, however, endeavour to answer the various statements set forth in both letters, and take "Rambler's" first. Mr. Grosser's bird was certainly smaller than mine, but I deny the statement that it was better in head—my bird, in my opinion, having a rounder head and fuller bulge when viewed from all points. As regards beak, mine was not at all coarse, although it might have been a trifle smaller ; and probably would have been had I used the trimming scissors. I can at least say that the whole of my bird's beak was at the show (I do not infer that Mr. Grosser trimmed his). In beak wattle the birds were equal. Now as regards ground colour, this is the cardinal point in an almond, and whatever my bird lost in other points it more than made up in this one, as there was no comparison between Mr. Grosser's bird and mine. In break of feather or spangling Mr. Grosser's bird was the better of the two, and, on the whole, I think there was very little to choose between them. As regards sending birds to Sydney, I would point out that the critic on Short-faced Tumblers, in summing up this section last year (composed mostly of Mr. Grosser's birds) remarked, "An ordinary lot, nothing out of the common," and it was in this section Mr. Grosser secured the (to him) much coveted title of champion, so, personally—although a Victorian myself — until recently, I think it just as meritorious to win in Adelaide as in Melbourne or Sydney.

I don't think in my last letter I claimed that my bird was a champion (I think I said only compared to Mr. Grosser's), but if I did I withdraw as I consider both mine and Mr. Grosser's easily beatable, and my idea of a champion is a bird very hard indeed to beat.

Now, in answer to the letter signed A. E. Grosser. This gentleman talks of taking a trip to England to show birds at the Dairy and Crystal Palace great show. Would it not be better, and doubtless cheaper, to stay here until he can humiliate yours truly at the local show. He has, to the best of my knowledge, shown four times against me—twice at the Agricultural show and twice at the Canary and Pigeon show, and, allowing three points for first, two for second, and one for third, I have, on three out of four occasions, beaten him in points ; and the last time we competed against each other at the agricultural show he did not obtain a place against me. On this occasion I used his purchased adult bird with two bred by myself (one only six months old), so he does not breed all the winners. On the fourth occasion Mr. Grosser was slightly ahead on points, although I won the special for the best Tumbler in show with the much-discussed Almond. As regards breeding winners Mr. Grosser certainly showed a decent bird (the cup winner at the last C. & P. show), but the other two were no wonders, and I think I am right in saying that four out of five winners owned by him are bought birds. Did he breed his so-called champion Almond? I think not, and that, like myself, he bought it from Allan Wilson, in England, who bred both his and mine, and agrees with both judges in South Australia that my bird was the better of the two, or at least I have a letter to this effect.

Mr. Grosser talks of surprising me at the next show. Well, this has given me something to look forward to, and I only hope that I will not be disappointed, and that I will see something quite out of the common, but as I have heard this so often from Mr. Grosser without any startling results I will not anticipate too great a treat.

In conclusion, I would like to mention that Mr. von Einem, who judged the Tumblers, has owned more high class pigeons than Mr. Grosser and myself put together, and the Tumblers I saw from his loft when I first arrived in South Australia were ahead of anything I have seen from the O.K. lofts. In fact, he owned the only real champion Almond cock I have seen in South Australia, and I myself owned the only Tumbler hen that could really be termed a champion (a yellow Agate), either of these could beat anything Mr. Grosser ever saw—much less owned.

Anyone who knows what is required to win at Crystal Palace will be much amused to hear of Mr. Grosser taking Tumblers there to win.—Yours, etc.,

C. WILKINSON.

Woodville.

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The Law of Mendel.

During the last few years the Pigeon, Poultry, and Livestock world generally has been very much disturbed in its mind over the discoveries of Mendel, who formulated a theory—based upon years of observation—which some hold to be quite contrary to the accepted tenets of Darwin.

It is my intention to briefly analyse this theory, and see if there is anything in it which may be of use to breeders, more particularly in the Pigeon world.

In the first place Mendel was a Monk who, during the latter half of the last century, made rigid investigations into the laws of heredity, taking as his subject the Sweet Pea. As the result of years of study he formulated the following doctrine :—"If two lines of breeding be crossed, for instance, Dwarf and Giant Sweet Peas—the progeny will fall into three groups. Group one will follow the general characteristics of the male parent, say the Dwarf peas; the second group will follow the female parent; and the third will partake of the characters of both. The groups will each be one third of the whole. If members of group one be bred together, they will breed true to type. If members of group two be bred together they will breed true to type. If members of group three be bred together they will produce equal quantities of the original three groups. Every generation will follow this rule.

Subsequent investigators have proved the truth of this contention with respect to plants, and it has been claimed to be true as regards Guinea Pigs. Owing to the high mortality of young pigeons it is difficult to say conclusively whether the law holds good, but personally I believe it does.

Let us apply its reasonings to a cross of say Owls and Carriers. One third of the progeny should tend to follow the Owl type, one third the Carrier type; one third should be decidedly mongrel in looks. For instance, group one should be long faced poor rosed Owls, but Owls withal. The second group should be short-faced and perhaps short feathered Carriers, but Carriers for all that. But the third group should be hopelessly mixed as to type, beak, colour, and marking. They would be nondescript. The progeny of class one would be Owlish; the progeny of class two would be Carrierish, but the progeny of class three would be of the three classes — Owlish, Carrierish, and nondescript.

Now fanciers may be prone to deny this proposition at first sight, but it were wiser to pause before so doing, because some of the most experienced breeders admit at least the possibility of its truth.

I shall now proceed to a simple mathematical consideration of the argument which may throw some light on the matter.

Suppose one is breeding Magpies, and has mated a bird of short beak with one long in beak. We disregard other properties for the time being. According to Mendelism the progeny would group into there classes—Short beaked, long beaked, and medium beaked. Now consider, say, nine birds of this union a third would be in each class. That is, there would be three short beaks, three long beaks and three medium beaks. Averaging up the birds in many sets of nines, we would find that we could grade the beaks regularly from the shortest to the longest, the difference between the lengths of each consecutive beak being, say, one-sixteenth of an inch. Thus, of the three short beaks one is the shortest of the lot, and of the three long beaks one is the longest of the lot. Now if the birds in question were matched primarily for the purpose of lengthening the beak, we find that, on my reasoning, every one bird out of nine would show an increase of length in beak.

Now, before I had heard of the Mendael theory, I had by my own experience, aided by what I could gather in conversation with other fanciers, come to the conclusion that an advance of one in eight or nine is all we can expect in breeding for any one particular point, so we find in this case that Mendel's principle explains what I had already learned by experience, and this is the usual test in Science applied to a theory. Of course we must not expect from a pair of birds which between them possess all the points in tolerable excellence, a "champion" once in every group of nine squabs, for the simple reason that the bird which makes the distinct advance in length of beak, may unfortunately be the one to be the worst defaulter as regards length of limb. In fact, from a pair of birds possessing all the points between them about 36 perfect birds in a million would be born!

To my mind, the chief lesson to be learned from the investigation, is that we must not expect too much, and that the way to success lies in the ruthless elimination of the inferior bird. Sell it, kill it, give it away, but for goodness sake cast it out. Another lesson is that to make progress we must have sufficient stock birds and breed as many as possible to have as many "nines" as we can to select from next year.

G. J. MEAD.

The question of proportional transmission of parental type is an interesting one, perhaps some other breeders will let us have the result of their observations.—Ed.)

That Elder's Trustee and Executor Company should have already made such substantial progress, although only a year has elapsed since the company secured its charter, is conclusive proof as to the need of such an institution. Certainly the company could not have possibly started under more favourable auspices. For several years the country has experienced a wave of unparalleled prosperity, and it is no exaggeration to affirm that thousands of people who stand to-day not only financially sound, but with a substantial estate to bequeath in the event of their demise, were in very parlous circumstances but a few years ago. Nearly every one is familiar with cases where the fortunate tiller of the soil has retired within a few years after taking up land, and many men who were absolutely down on their luck five years ago are now in affluent circumstances. The time of such an access of wealth to the community certainly affords an ideal opportunity for the starting of a sound trustee and executor company, especially when the latter is associated, even if indirectly, with an institution whose progress has been so closely associated with the progress of the State, and is so widely esteemed as the firm of Elder, Smith & Co., Limited. Such an association cannot fail, we are sure, to be of immense benefit to the new company. The accession of wealth to the community brings with it responsibilities, and one of the chief of these, as far as the individual is concerned, is that of taking the necessary precautions to ensure that estates will be properly administered after death. Life is proverbially uncertain, but in too many instances this fact seems to be overlooked. Whether the means be great or small, it behoves every man — and more especially the man with a family dependent on him—to set his house in order, make his will, and appoint his executors. The problem as to whom to appoint to such a responsible position is in most cases not easily settled. The office of executor is one of great responsibility, and one that calls not only for the greatest probity, but also sound judgment and a knowledge of business details. How few men, on casting their eyes round, are able to select just such an one amongst their circle of friends or acquaintances. It is just here that Elder's Trustee and Executor Company comes in. The institution being a permanent one, the possibility of trustees dying before estates have been administered — which not infrequently happens—need not be considered, nor the worrying thought of possible incompetency, or even dishonesty, on the part of the individual trustee be taken into account. The directors are men of the highest repute; there is a highly trained staff who are specialists in this class of work; and as a large number of estates are being administered at the one time it will be obvious that this must effect a great saving in expense. Looked at from every point of view the wisdom of entrusting one's affairs to a trustee company in preference to a private individual must be apparent to all who give the subject calm consideration. As these companies become more largely availed of, it is not unlikely that the individual trustee will practically disappear, for the man who takes such a position, does so at the risk of his own peace of mind and not infrequently exposes himself to legal liabilities undreamt of at the time.

Home Notes.

Household Hints and Recipes.

— Cracks. —

For stopping cracks in woodwork an effective way is to soak newspapers in a paste made by boiling a pound of flour in three quarts of water, and adding a teaspoonful of alum. The mixture should be as firm as putty and should be forced into the cracks with a blunt knife; it will harden like papiermache. When dry it may be painted or stained to match the wood, and will be hardly perceptible.

— To Clean Varnished Paint —

Remove the dust with a dry duster, and then wash the paint with luke-warm water and soap, but avoid the use of a strong alkali in the water. Grained and vanished wood is improved if water is obtained by pouring boiling water over spent tea leaves, and, in this case, the use of soap is unnecessary.

— To Clean Hair Brushes. —

The best way in which to clean hair brushes is with ammonia and warm water. Take a tablespoonful of household ammonia to one quart of water; dip the bristles up and down in the water without wetting the back; rinse in clean warm water; shake well and dry in the air, but not in the sun. Soap and soda soften the bristles, and will turn an ivory-backed brush yellow.

— To Detect Dampness in Beds. —

Let the bed be well warmed with a warming pan, and immediately after the pan is taken out introduce between the sheets, in an inverted position, a clean glass goblet. After it has remained in that situation a few minutes, examine it; if dry, and not tarnished with steam the bed is perfectly safe, and vice versa. In the latter cases it will be best to sleep between the blankets.

— To Clean White Marble. —

Scrub it with a soft brush, useing hot water and one of the special soaps widely advertised. Rinse it well, and dry it with a soft cloth. Polish it with a damp flannel dipped in puttypowder.

— To Color Jellies. —

Where varieties in color are desired, variegated layers may be made by adopting the following harmless methods :- For crimson, bruise a little cochineal, dissolve it in a small quantity of brandy, add it, to the calf's foot jelly. Yellow: Take a little saffron, tie it in a rag, and dissolve it in cold water. Green: Boil a little spinach, take off the froth, and mix it with the jelly. White: Put in pure cream. Where various colors are required in one mould, mix the jelly and desired colors in separate vessels. Pour one color into the mould, and when set add the next color. In this way a mould of several colors may be made.

— To Preserve Lemon Juice. —

To preserve lemon juice, the expressed juice is poured through a cloth, and then mixed with one-fourth of its volume of powdered talc, whereupon it is shaken about one-quarter houz. It is then placed aside for one half hour, shaken again, allowed to stand, and filtered. Filter through paper, add 10 per cent. of sugar, and bring to the boil. During this time, place the bottles to receive the juice in a kettle of water, fill them with water, and boil them in the kettle. Empty the bottles, pour in the boiling lemon juice as quickly as possible, and close up at once with a good cork, previously dipped into wax. Juice prepared and bottled in this manner is said to possess unlimited keeping qualities.

— Lemon Mincemeat. —

Grate the rind of three large lemons, squeeze out the juice, boil the rest of the lemons until tender enough to pulp. Chop very fine. Add this pulp to three large baked apples, which must be cored and the skins removed; add one pound of stoned raisins, one pound of currants, one pound of suet finely shredded, two pounds of moist sugar, one ounce of sliced lemon candied peel and the same of orange peel. Mix all very thoroughly, add a teacupful of brandy and two tablespoonfuls of marmalade. Put the mincemeat in a stone jar with a cover, and in a fortnight it will be ready for use.

— Roast Goose. —

Be careful in selecting a goose to get a young one, as old ones are very tough, and require special cooking to make them fit to eat. The young goose can be distinguished by its soft, yellow legs, which are covered with down, while those of an old goose are a reddish colour and have long hairs on them. After the goose is properly drawn wipe it inside and out with a damp cloth, and fill it with this stuffing: Boil and mash three or four potatoes and four good sized onions, add while all is

hot a tablespoonful of butter and two of milk, two teaspoonfuls of powdered sage, a tablespoonful of sweet marjoram, one of salt, a good teaspoonful of pepper, and the beaten yolk of one egg. Sew up the opening and truss. Allow twenty-five minutes to every pound when roasting, and baste ten minutes. Meanwhile stew the giblets for the gravy. Serve good gravy in one tureen and apple sauce in another.

— Stuffing for a Turkey. —

The necessary ingredients for this dish are two ounces of lean ham, quarter of a pound of suet, the rind of half a lemon, a teaspoonful mixed sweet herbs, salt and cayenne to taste, six ounces of fine white breadcrumbs, and two eggs. Chop the suet, lemon rind and herbs finely, taking care that all be very well minced. Season to taste, and add a very little mace. Mix all the dry ingredients thoroughly first. Beat the eggs and add to the ingredients. Fill the breast of the turkey with this so far as the loose skin will allow. Truss smartly, and either boil or roast the bird. When a turkey is roasted it needs continual basting. A turkey for boiling should be wrapped in buttered paper, as this helps to keep the skin moist and white. The water should be at boiling point when the bird goes in then allowed to boil up again, and then simmered very gently. Keep the water nicely skimmed from time to time, for scum is likely to boil down again into the water and make the meat a bad colour.

— Oxford Sausages. —

Chop a pound and a half of pork, and the same quantity of veal, and three-quarters of a pound of beef suet; mince and mix them. Steep a pound of bread without crust in water, put it with the meat, adding some minced sage, with pepper and salt to taste.

— Potatoes mashed with Onions. —

Boil and dry the potatoes, mash them carefully, and mix in three or four onions, which have been boiled soft, and finely minced. Add a little butter, pepper, and salt. Put the mixture in a baking tin, score the top, and brown in the oven.

— Pineapple Custard. —

One teacupful of chopped pineapple (the tinned fruit does excellently), one pint of milk, one stick of cinnamon the yolks of three eggs, one tablespoonful of sugar, and ½oz. of leaf gelatine. Boil up the milk slowly with the cinnamon, and beat up the eggs with the sugar and tablespoonful of milk. When the milk boils, put in the gelatine, and stir it till it dissolves, then strain it on to the eggs, stirring well, and add the pineapple. Have ready a wetted mould, pour the mixture into this and leave it to set. Turn out and serve with a little of the pineapple syrup round it.

— Fruit Preserved in Grape Juice. —

Any kind of fruit can be preserved by this method, but it is particularly good for apples, pears and sweet plums. No sugar need be used in this process. Boil six quarts of grape juice in an open preserving kettle until it is reduced to four quarts. Have the fruit washed and pared and, if apples or pears, quartered and cored. Put the prepared fruit in a preserving kettle and cover generously with the boiled grape juice. Boil gently until the fruit is clear and tender, then put in sterilised jars.

— Rice Mould and Prunes. —

Put six tablespoonsful of rice in a double saucepan with half a pint of milk, and boil till quite tender; add more milk as required. When done, stir in a little sugar and a pinch of salt; turn into a ring mould and let get cold. Turn out; fill in the centre with stewed prunes, and cover all over with whipped cream; blanche a few almonds; cut them in strips, and stick them all over to garnish. To stew the prunes put them in a stewpan with half a bottle of claret, half pound of sugar loaf, and the rind of a lemon, and stew gently for three-quarters of an hour. When the prunes are tender, take them out, and boil down the claret with some more sugar till it forms a thick syrup. Then pour over the prunes and let get cold; then use as directed.

— Prussian Puffs. —

Make a very light batter, mince some candied orange peel fine; mix with the batter. Put it into greased cups, and bake in a quick oven. Serve with wine sauce.

— Punch. —

Here is an old recipe for this old-fashioned drink: Boil one pint of milk with the yellow rind of about a quarter of a lemon. Take the saucepan from the fire, remove the rind, and quickly add two eggs which have been beaten in a little cold milk. Let all heat, but not boil. When very hot add one wineglassful of brandy and two of rum. Beat the whole thoroughly. Strain through muslin, and serve as preferred, hot or cold.

GOLD MINES
AND
CLEMENTS
..... TONIC .....

The following testimony is given by Mr. E. Litchfield, who is a well knnwn mining expert of Melbourne a recognised authority upon expert mining ventures and speculations. His opinion ranks as first-class in mining matters and he is often sent to other States to report on mining schemes and to secure options. Mr. Litchfield writes the following:—

31 Queen Street
Melb. 23/1/11.

CLEMENTS TONIC LTD.

"My vocation having led me into places throughout Australia where an equable diet was impossible, I have frequently suffered from kidney and liver troubles, with a dull pain in the back, lassitude and headache. I have found that a few doses of Clements Tonic have ended them.

Your tonic has no disagreeable re-action like many other remedies, but after using, a feeling of brightness and cheerfulness follows."

(Signed) E. LITCHFIELD.
Witness: A. S. Watson, J.P.

To Victorian people in any part of the country where medical men are few and a good reliable medicine is required, Clements Tonic is the one that should be kept in the house. It never fails to relieve in cases of Constipation, Biliousness, Low Spirits, Poor Blood, Loss of Sleep, Sluggish Liver, Sick Headache and Palpitation. Keep it always in the house. All chemists and stores sell it through Australia.

This man consulted several doctors in Young (N.S.W.). Life was a misery.

"YOU MUST HAVE AN OPERATION"

A Clements Tonic Cure.

I tried all sorts of medicines and all sorts of pills uselessly.

Tubbal, via Young, N.S. Wales,
CLEMENTS TONIC, LTD. 15th August, 1911.

"A few years ago I was a miner and I worked for years in wet ground, and now in my old days it is telling on me, for I suffer with my kidneys and backache and loss of appetite.

"I saw several doctors in Young; they told me I had Hydatids, and said an operation would be necessary. Their medicine did me no good. I resolved not to have an operation, and I was so used up that I COULD NOT WALK ANY DISTANCE, often having to have a spell after a short walk. I have tried all sorts of medicines and all sorts of pills, and MY LIFE HAS BEEN A MISERY to me through continuous ill-health, UNTIL I TRIED CLEMENTS TONIC. THE first and second bottles did me no good, but the third did. I WAS SURPRISED AT THE GREAT CHANGE THAT CAME OVER ME. I felt as well as when I was 21. I can eat and sleep well, and work is no trouble to me, and I think that CLEMENTS TONIC OUGHT TO BE WRITTEN IN GOLD. I always keep it in the house. I have just taken 23 bottles, and I never intend being without it. To me it is past all understanding. AND I THINK IT IS ONE OF THE GREATEST NERVE CURES IN THE WORLD. I recommend it to anyone broken down in health. You can do as you will with this letter, AS I AM HERE TO 'PROVE WHAT IT HAS DONE FOR ME.

(Signed) J. WISEMAN.

◆

Mr. Wiseman says Clements Tonic should be written in Gold, and says it has made him feel a New Man.

◆

You can be readily benefited by using this great tonic if you suffer from loss of Sleep, Debility, Nervousness, Poor Blood, Inactive Liver, Weakness, Indigestion or Constipation. It has a toning effect upon the kidneys. It makes the sick well. ALL CHEMISTS and STORES Sell it.

Received.

PLANT FOR IDENTIFICATION.

Small parcel containing portion of plant, presumably for identification, received during the month but no letter or other means of addressing sender. Specimen too dry and damaged for us to reply with any certainty. If sender will forward again, packed between two pieces of damped blotting paper or card, and if possible, include flower or seed case, we shall be pleased to do our best to supply any information he may require.

◆

A reduction in temperature of from 10 to 15 degrees during the summer months makes all the difference in the average home between absolute comfort and discomfort, and yet thousands of householders neglect to take advantage of the facilities provided for bringing about such a very substantial reductions. Experience has proved that galvanised iron is the best conductor of heat obtainable, and therefore in its natural state it is just about as unsuitable a material for roofing in a climate like ours as could possibly depise. It has, however, the saving grace of cheapness, and as it is impossible to transform it from a conductor to a non-conductor of heat by covering it with that ideal roofing-paint, King's Compo, a simple and inexpensive remedy for its otherwise unsuitability, is at hand. King's Compo is not only cheap, but is easily applied, and what is equally important its effects are lasting. It is sold in large tins at 7/6 by King and Co., of Waymouth Street, and is obtainable from all storekeepers, ironmongers, and color merchants. The greater part of the summer is still before us so that an excellent opportunity for testing the advantages claimed for it presents itself. We feel sure our readers will not be disappointed.

O.K. LOFTS.

This is where the Champions are bred. At 1911 Sydney Royal we won 2 Champions, 6 Firsts, 3 Seconds, 2 Thirds with 11 entries only. At S.A. Pigeon and Canary Show we won the "Blondinette" Cup, the "African Owl" Cup, against 15 others also the "Short-face Tumbler." Cup for best young tumbler, all with home bred birds, also a number of Specials, Firsts, Seconds, and Thirds. To give amateurs a start I have for sale Blondinettes, African Owls, Short-face Tumblers, Nuns, Turbits, etc., from 5/- each. Fifty to clear before breeding season. Apply at once to—

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Editorial Notices.

TO ADVERTISERS.—Alteration of advertisements should be in our hands not later than the 15th of the month.

SUBSCRIPTION.—Posted to any part of Australasia 5/- per year, in advance. Foreign, 6/.

ADDRESS—85, Currie St., Adelaide. Telephone, 1234.

AGENTS.—Messrs. ATKINSON & CO. and MESSRS. GORDON & GOTCH, Ltd.

The Editor will be pleased to receive correspondence and answer questions These replies will, for the most part, be sent by mail, unless received just prior to date of publication.

PUBLISHING DATE.—On the 25th of each month preceding title date.

DISCONTINUANCES.—Responsible subscribers will continue to receive this journal until we are notified by letter to discontinue, when all arrears must be paid.

Garden Reminders.

Roses may be budded as long as the sap is running freely. Get dahlias staked early otherwise they may be spoilt also thin out the weaker growths. Lawns of buffalo or Couch may still be planted, they will want plenty of water. Cuttings of carnations may be struck. Get soil and seed boxes prepared for Autumn sowing. Pansies, Tenweek stock and Phlox Drummondi should be sown freely in pots or boxes. Prepare beds for the Spring flowering bulbs. Gladiolus which have flowered will be better if taken up when they die down and rested for a few weeks. Save the tiny bulbs which will be found around the old ones and sow thinly in a box or seed bed. Keep the liquid manure can going so as to get the best possible display of bloom. Keep a look out for caterpillars particularly on asters and zinnias and destroy them or they will surely spoil the plants. Any ripened seed of dephinium, 'snapdragon, carnation, etc., should be collected and stored in a cool but not damp place, it is only worth while taking seed from the very best of the plants. Watch the chrysanthemums, some of the early varieties will soon be showing bud. Trim up the roses by cutting out weakly growths, shorten the stronger growing stuff and water and mulch for autumn bloom. Keep seedlings of Cinerarias, Primulas, Petunias Cyclamen etc., growing freely, taking care that they are not allowed to damp off. Any of these may be sown this month for later flowering. If no convenience exist for striking cuttings or raising seed, a very few shillings invested in a large drapers box and a yard or two of calico plus a couple of hours work will be a great help in keeping the garden bright. Potted cyclamen will want a little attention, they should be kept on the dry side but not dust dry. Where necessary they may be repotted now or later. Bouvardias may be planted out. They like heat as long as they have moisture at the roots and some shade, Kenneydias and Bouganvilleas also do well if put out this month. Cuttings of all the pelargoniums may be put in now. Use short jointed well ripened wood. Most of them will root all right in the open but all will do better at this time of the year if given some protection from the sun, always use sandy soil for soft wooded, in fact for all cuttings, Hydrangeas, fuchsias and such like plants should be cut back after flowering. Cuttings of the young growth which will follow will root readily. We don't grow either of these nearly as much as we ought. Prepare a piece of ground for winter-flowering sweet peas. Fairly light well drained soil in an open breezy position is what they want. Another sowing of Balsam can be made, they naturally make quick growth and must be kept on the move right from the start. Ranunculus and Anemone seed can be sown this month, the plants will flower next Spring. They will do all the better if sown where they are to flower. Mulch and a little shading with small branches of evergreen will pull the little plants through any hot time we may have.

Planting-Out Young Carnations.

Where layering was done early the young plants ought now to be excellent condition for removal from the parent, and the sooner the work is done the better. It is a good plan to go over them a few days previous to lifting and sever the layers from the old plant with a sharp knife. Removal is felt less than when the young plants are severed and lifted at the same time.

The Carnation is a perfectly hardy plant and, except in the wettest and coldest of soils, will grow unharmed. Even where the natural soil is cold and wet it may be considerably improved by the addition of road scrapings, old mortar, wood ashes, burnt earth or similar lightening material, this being thoroughly mixed and deeply dug into the ground at once, breaking any large lumps encountered.

Lift the young plants with as much soil adhering to their roots as possible and transfer them to the prepared bed without delay, taking care to avoid deep planting and make the soil moderately firm around the roots.

◆

Planting Snowdrops.

Next month is a good time for planting the bulbs of this charming little flower. It is true that good results can be and are secured from later plantings; but nothing is gained and much may be lost by any delay in getting the bulbs into the soil. Wherever they are planted they should be placed in masses, as the effect is then much better than when a bulb is placed here and another there. For planting in grass or the fronts of shrubberies, or for carpeting a bed of deciduous shrubs, the Snowdrop is eminently suited, while clumps dotted about in nooks and shady corners are most pleasing in the early days of spring.

The plants are not at all fastidious as to soil, as they will thrive in almost any, except that of a very wet and close character. Two inches is a good depth to plant the bulbs, taking care that each one is placed quite to the bottom of the hole. In addition to the common and double-flowered Snowdrops there is a large-flowered and handsome one named Galanthus Elwesii. A few bulbs planted in a medium sized pot make a very pretty decoration for the house or verandah.

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As a preventative to the spread of POTATO BLIGHT (Irish blight) SCAB, BROWN RUST, etc., Immerse all seed potatoes in SICKLE BRAND FORMALIN 1 lb. to 32 gallons water. Soak uncut tubers in the solution for 2 hours, spread out to dry, cut and plant as usual. It is important not to cut tubers before treatment.

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1/6 per 1 lb. bottle, 14/- per gallon bottle, 12/6 per gal. in 3 gallon jars, 1 gallon — about 11½ lbs.

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CURRIE STREET.

List of Shrubs, Etc.

Dear Sir.—I beg to ask you a few questions which I hope you will answer. The first is, viz:—

1. What is the correct Botanical name for the "White Cedar." I have always known it as "Melia," but on referring to Wright's Dictionary it is stated to be Thuya gigantea. Is this correct?

2. What is the best way to improve a stiff clay to a good garden soil, in the cheapest way. Will stable manure improve it much?

3. What are the best 24 shrubs for a cold climate, that is where heavy frosts fall; and dry summers. I want shrubs about two to five feet high.

Hoping to hear from you soon, I am, etc.,

"STUDENT."

1. You are referring to two quite distinct trees. Thuya gigantea is an evergreen forest tree growing to a height of 50 to 100 feet. It is one of the Coniferae and so allied to the true Cedars. Evidently from what you say it is sometimes known as The White Cedar, though we have not come across the name before as applied to this tree. The "White Cedar" to which you doubtless refer is Melia azedarach, a quicker growing but much smaller tree. It is deciduous and carries an abundance of scented lilac bloom in spring, followed by yellow berries. The tree is of graceful habit and the foliage is handsome. It is very generally planted in gardens and on lawns. The chief objection to it is the mess made by the fallen fruits. You will generally find hundreds of young seedlings around an old tree where the ground has been left undisturbed for a few weeks in spring.

2. There is no better way of converting a stiff clay into a good garden soil than by the addition of plenty of rough stable manure. Manure serves a double purpose. It improves the texture of the soil and adds direct plant food. It may not, however, be the cheapest way, that will depend on circumstances. Lime also makes such a soil much more workable and is an indirect manure, in that it converts latent plant food into available form. Sand is without any chemical influences, but it acts mechanically in opening up the closely packed soil particles. Seaweed, ashes, road, sweepings, and garden refuse are all helpful. The same money invested in either of the above would probably have approximately equal results, but often one has on hand or can procure a good supply of one or the other without much cost. In any case dig the ground deeply, two spits at least. Incorporate whatever you are using throughout the bulk of the soil, except in the case of lime, which should be left till the first digging, is completed, and then be spread evenly over the bed or border and lightly forked or hoed in.

"The Best Security on Earth is Earth itself."

! ! !

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3. We cannot select the best twenty-four shrubs but any selection from the list of following small to medium should prove satisfactory. Latanas—many varieties, flowering summer and autumn. Veronicas—many varieties, V. Andersoni variegata is good. Abutilion—many varieties, all good. Acacia—A. spectabilis or A. verticillata, should suit you. Russelia juncea—a useful dwarf evergreen, scarlet flowered. Spiraea—many varieties. Tecoma — T. grandiflora and T. Mackeni, are both beautiful. The latter is an evergreen. Sattice macrophylla—a dwarf evergreen. Deutzia—D. gracilis is about the best. Plumbago—the common blue flowered variety is P. capensis. Swansona, either alba or rosea. Wiegela—you cannot go wrong in getting either of the common pink or white forms. Euonymous ovatus aureus—beautiful foliage shrub. Aralia Sieboldti—very good. Lavatera arborea variegata—handsome foliage. Buxus sempervirens variegata—another foliage plant well worth growing. Lagerstroemia Japonica—a valuable deciduous shrub. Nerium—you should include one or more of the Oleanders—Linum trigynum—very dwarf, flowers in winter. Hibiscus—many varieties, mostly evergreen. Braziliensis grandiflora, Peachblow, Syriacus, and Syriacus alba fl. pl., also spendens are all excellent. Magnolia—M. conspicua, would probably succeed with you. It is one of the deciduous Magnolias. Diosma—common but good. Daphne indica and Choisa ternata, the same. Genista—G. fragrans, is dwarf and free flowering. Aloysia—the scented verbena, is of course, very common, but well worth a place in any garden. Mahonia aquifolia—Diplacus glutinosus—Duranta—Erythrina compacta—Escallonia Exoniensis and Cydonia Japonica, come within your requirements. The double flowering cherries peach and plums, are on the big side, but you might work in one or two with advantage. The above list rather exceeds your limit. Perhaps some reader will reduce it to the best 24 or substitute others. You can get fuller descriptions from any nurseryman's catalogue and, of course, a very much wider selection.

Bedding Roses and Bold Effects.

That bedding Roses will be a feature in every garden requires no word of mine to assert, for s it evident wherever one goes. Masses of a sort are the order of the day, and truly grand the beds appear. I have been particularly pleased with some beds I prepared and planted in April last. The land, a grass meadow, was simply ploughed over, and as I thought the depth of soil would not be sufficient, I marked out good wide paths and shovelled the soil from these paths on to the beds, which were some 5 feet wide. The beds were allowed to lie and settle down; then came the wintry weather in April, which hindered the planting. However, we were able to plant towards the end of the month, every plant being cut down at the time to within 3 inches or 4 inches from where it was budded.

Planted in bold masses, one can see the true value of certain Roses, and one is tempted to cover more land, so that one could plant a good mass of all the grand decorative Roses now obtainable. How superb in colour is Chateau de Clos Vougeot, quite the best deep maroon-coloured Rose we have as a bedder' Victor Hugo is grand, but not so effective; and Fried-richsruh rather hangs its head too much, which is a great fault with a bedding Rose. By the side of these dark colours we want yellows and creams, and what can we get in this way? We shall have to wait a while for Rayon d'Or, for at present its price is prohibitive; but when it is cheaper, what a clamour there will be for it! Harry Kirk and Mrs. Peter Blair are grand, but I think Duchess of Wellington surpasses both. Mme. Ravary and Le Progres are beautiful in the extreme, and Mrs. Aaron Ward will be a great favourite, for its flowers stand up well. Marquise de Sinety is a marvel of colouring, and has been a great favourite this year; but Lady Hillingdon has been disappointing, its growth and bloom being much too thin. Arthur R. Goodwin is also grand. Among the paler yellows, Melanie Soupert and Mm. Hoste are most charming. I am expecting great things from Melody. What I have seen of it has given me a most favourable impression. James Coey is also a beautiful yellow bedder. Of the lighter reds, Ecarlate and General Macarthur have well maintained their positions as being two of the best scarlet or red bedders; but Leuchtfeur and Charlotte Klemm, as well as President Taft, will be formidable rivals to these two beauties.

George C. Waud is so unique in colouring that is demands a special note, the orange vermilion colouring and excellent growth placing it at the very top of garden Roses; in addition, it is a good show bloom. Liberty and Richmond are both good brilliont sorts, but this season has tried them, and they have not been specially good with me. When we are able to plant the beautiful novelties Edward Mawley and Leslie Holland, we shall have nearly all that we require in the matter of brilliant bedders.

Of pink varieties, Caroline Testout and Mme. Abel Chatenay still maintain the lead, and it will take something good to displace them. Betty has been rather poor this hot season, but Mme. Leon Pain has been superb, its orange pink buds being quite charming. Lyon Rose is, of course, a popular sort, and will remain so until M. Pernet-Ducher sends us his improvement upon it. He has a variety name Willowmere, which, I believe, will surpass the Lyon. I have been greatly charmed with Herr Peter Lambert's Frau Oberhofgartner Singer. It is so delightfully *new*, and that is more than one can say of many new Roses. Of course, one must not omit Mme. Jules Grolez, still one of the best rose pinks; while in a little lighter shade Mme. Maurice de Luze has found many admirers. Reliance is a lovely glowing pink, with wonderfully large guard petals. Of the pale blush and white shades, Pharisaer, La Tosca and Prince de Bulgarie still hold their own. White Killarnly this season has been very poor, and I doubt whether it will ever be of much use. Peace is lovely in autumn; so also is Mme. Antoine Mari. Of course, there are hosts of others, but I think those who plant all the varieties I have recommended, will have most of the best for the special purpose of bedding and massing.
P.—In "The Garden."

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Rose Analysis.

For the last 25 years the name of every Rose in the first, second, and third prize stands has been taken down at the leading British show of the season—that held annually in London in July by the National Rose Society of England. The results thus obtained have been tabulated, and the varieties arranged in the published tables acording to the average number of times each Rose was staged at the last eight of those exhibitions. This applies to nearly two-thirds of the Roses which find places in those tables. For the sorts of more recent introduction the longest trustworthy averages are given instead; while the still newer kinds are placed according to their records for the last exhibition alone.

Bessie Brown still stands at the head of the table of h.p.'s and h.t.'s, a position it has now held for six successive years. The first six varieties are also the same as in the last analysis, although their relative positions may be somewhat different. The only changes worth mentioning in the first twenty-four roses beyond the lowered positions of Lady Ashtown, Mrs. W. J. Grant, and Alice Lindsell, owing to their poor records at the last exhibition, are the return once more of Captain Hayward and Her Majesty, and the omission of Mrs. R. G. Sharman Crawford, now at No. 25, Helen Kellor, now at No. 26, and La France, now at No. 29, their places being filled by Her Majesty, Lady Ursula, and Captain Hayward. Comparing the first twenty-four varieties in the analysis with the first twenty-four arranged according to the number of times they were staged in the prize winning stands, taking their records at the last exhibition of the society alone, the differences in the two lists considering the exceptional character of the season, come out not nearly as great as might have been anticipated. In fact, the only changes necessary would be the inclusion in the latter list of Lady Moyra Beauclerc, Earl of Warwick, Mrs. J. Bateman, Mrs. Stewart Clark, and Oberhofgartner Terks, and the exclusion of Mrs. W. J. Grant, Kaiserin Augusta Victoria, Alice Lindsell, S. M. Rodocanachi, and Captain Hayward.

The Newer H.P.'s and H.T.'s.—In this analysis by newer Roses is meant those varieties which are five or fewer years old. On the table of h.p.'s and h.t.'s there are no fewer than twelve varieties entitled to be so classed, against nine in the last analysis. Taking first the Roses, two in number, which were sent out in 1906, William Shean (pink), a fine exhibition Rose, but not suitable for ordinary cultivation, has since the last analysis risen from No. 14 to No. 12. Yvonne Vacherot (porcelain white, tinted blush, on its first appearance takes up a place at No. 59. Of the five varieties in the list which were first distributed in 1907, the Lyons Rose (salmon pink, suffused yellow) take the lead at No. 7, having risen since last year from No. 15 to No. 7. Seldom has any newcomer made its mark, both as an exhibition and decorative Rose, so rapidly as this now well-known and popular variety. Whether its insertion be an improvement to the appearance of a stand of Roses is doubtful, but one thing is quite certain, no other Rose in the show "catches the eye" so quickly. Avoca (deep scarlet crimson) comes next at No. 42, having gained fourteen places since last year. Mrs. Stewart Clark (bright cerise pink), No. 48, a very vigorous grower, and fragrant withal, is new to the anlysis. Gloire de Chedane Guinoisseau (crimson), No. 59, is also new to the list. Queen of Spain (pale flesh), No. 59, a hot weather variety, again makes its appearance in the table after a year's absence from it. Of the 1908 varieties, Lady Ursula (flesh pink) has performed a striking feat in taking up a place on its first appearance in the analysis at No. 23, and so finds a place at once among the leading 24 varieties. It is not only good as an exhibition Rose, but promises to be equally serviceable in the garden. Dr. O'Donel Browne (carmine rose), No. 40, is to be welcomed as a dependable Rose for whatever purpose it may be required. G. C. Waud (rose, suffused orange), has not fulfilled the promise made for it last year, for it has since then fallen from No. 48 to No. 50. It may have been the season, or that it is not quite large enough for exhibition, but in any case it is a most charming and distinct variety. The only representatives on the list of the years 1909 and 1910 respectively are Margaret (soft apricot rose) and Mrs. Coxhead (claret read).

Much is often said about the lack of fragrance in all the Roses of recent introduction. Taking, however, the above twelve varieties, this contention is not borne out, for on reference to the new edition of the National Rose Society's "Official Catalogue of Roses," two of them are described as "fragrant" and three others as "very fragrant." This, of course, does not mean that the remaining seven varieties have no fragrance at all, but that they are not especially sweet scented.

The first six varieties in the table of teas and noisettes remain the same, and are in the same relative positions as in the two previous analyses. The only noteworthy incident as regards the established varieties is in regard to Mrs. Edward Mawley, which at

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he 1910 exhibition was staged in o fewer than 100 prize stands, vhereas this year it was to be een in only 34, the former being he greatest number and the later the smallest number since rst that variety was in general ultivation. On the other hand, he two Cochets and Mme. Jules iravereaux were rather more freuently shown than usual.

There are as many as six of the ewer teas, varieties which are ix or fewer years old, in the able of teas and noisettes. In act, all the six years are repreented by one of these newer teas, nd 1908 by two. Mme. Constant upert (deep yellow, shaded each) is the sole representative f 1905. It is a most charming ariety, and has since last year isen from No. 11 to No. 7. Mrs. lyles Kennedy (creamy white) vas distributed in 1906, and has ince the last anlysis risen from o. 26 to No. 23. Harry Kirk bright sulphur yellow), first inroduced in 1907, has, on the ther hand, fallen to the bottom f the list, from No. 24. The two 908 varieties are W. R. Smith white, tinged blush), which has isen from No. 25 to No. 8, and Iolly Sharman Crawford (eau de il white), which, on the contrary, as retreated from No. 8 to No. 5. Mrs. Hubert Taylor (creamy vhite, suffused with pale rose), listributed in 1909, has since last ear risen from No. 29 to No. 26. he newest variety in the table, Irs. Foley Hobbs, which came ut in 1910, makes its first apearance at No. 22. It will be een that nearly all these newer eas are making upward progress, nd that some of them already occupy very promising positions. It will be also noticed that four of them are either white or nearly white in colour.

By the term decorative Roses is meant those varieties which are either not sufficiently large or not sufficiently regular in form to allow of the individual blooms being set up singly at shows, like the Roses with which we have previously been concerned. Turner's Crimson Rambler still heads the list, followed, as last year, by Mme. Abel Chatenay and Gustave Regis.—"The Leader."

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The Popular Pansy.

Pansy seed must be sown very early in February. Unless you do this your flowers will be late. Get the best strain possible, and give it every chance. Sow the seed in a light compost made by using equal portions of sand and leaf mould. Add a little very old manure, but on no account make the material in any way rich. All seedlings do best when they are grown naturally and without much forcing food. When you transplant them into their flowering quarters it is quite early enough to hustle the plants along.

The best pansies we have ever seen were grown in a light, sandy loam that had been fortified with well-rotted sheep manure that had been in the heap for two years. The blooms were immense. We hardly like to say how big they were in case you should think we are romancing. If sheep manure can be procured get a few loads in and let it rot so as to be ready for a future day. Big exhibition blooms can easily be grown if you will but take trouble to feed the plants properly. Without a special course of feeding pansies are not worth bothering with.

Shallow seed boxes should be used for raising all the annuals. Trusting young things to the open beds, where they take whatever hardships that are offered is a greenhorn's game. Go one better than that. In the bottom of whatever box is used some holes must be bored for the purpose of carrying off any surplus water. Over the holes put in quite an inch of new or old manure. On top of this you pack in the soil, which must be moist enough to hold together when taken and squeezed in the ball of the hand. Dry soil is no use at all. It is next to impossible to get it even damp once you have rammed it into a box. Make it moist, and keep it so all the time the seedling plants are in the boxes. Flatten down the surface with a half brick or a piece of flat board. Then lightly sprinkle the surface before sowing the seed. Take the seed and mix it with an eggcup full of dry sand. You can then spread it easier and more evenly.

Let the cover be a very light one. A sprinkling of sand, with a final touch of sifted manure to keep the surface both cool and open, is all that any of the smaller flower seeds need. Burying them under an inch of earth is both foolish and wasteful. A piece of wet sacking tied over the top of the box will quicken the germination. After the first two days lift the bagging off every morning to see how matters are progressing. Once the young plants are through the ground there is no further need keeping the box covered so closely. Take the bagging away, and use a piece of window-gauze in its place. This material makes a fine protection against heavy rain, birds, chickens, slugs, snails, or even cats.

When the young seedlings are an inch high you can bed them out in other boxes 'or seedling beds, at six inches apart, to promote a good root system prior to shifting them into their flowering quarters. This transplanting is always done by professional growers who know the value of the move. You had better follow the lead. It is a good one. And look, when you shift the pansies the last time let new quarters be as rich as it is possible to provide, for this pretty little favourite does so like good living.—"The Amateur Gardner."

Readers ! **Can you write us something about your methods of breeding, rearing, and managing Live Stock? Let us have it if it will only fill the back of a Post card.**

Annuals and Biennials.

From a horticultural standpoint an annual is a showy flowering plant which lives but one season, and consequently, requires to be raised from seed each year.

A biennial is a showy flowering plant which is produced from seed in one year, and blooms, ripens its seed, and dies the year following.

These definitions do not always hold good as there are some annuals that can be kept longer than one year, if they are restrained from flowering and fruiting.

Annual plants give more pleasure to a larger number of persons, are less expensive, easier to grow, and give quicker results than any plants that are grown in our gardens. They are the poor man's plants as well as the rich man's. They are not like the orchids which can only be enjoyed by the wealthy, in fact, they are the real plants for the people. They are so cheap that there is no excuse for any one to be without plants.

—Origin of Annuals.—

No doubt some of you have wondered, as I have, why Nature gave such a short period of time to these plants to complete the cycle of life, while to others she has given an almost indefinite time to live. Why are they so short lived, and have they been always annuals? These are puzzling questions, and very little has been written about them.

To answer the question as to why they are so short lived—it probably came about in this way: —At one time, where these plants were growing they were about to be driven out of existence by some agents—probably by cold in cold climates and by drought and heat in dry and hot climates. When a plant's life is in danger it always tries to reproduce itself. Therefore these plants under those hard conditions flowered early and produced an abundance of seeds which carried them through the trying seasons, and they were able to again reproduce themselves when congenial conditions prevailed. Doing this same thing for many years they inherited this mode of reproducing themselves annually from seed, and were saved in this way from extinction. This change did not take place all at once, but required a long period of time. The whole question is one of environment and inheritance.

From a horticultural standpoint this shortness of life is not such a drawback as some people imagine it is; the fragile flowers and transient beauty of the annuals make them all the dearer to those who love a touch of sentiment in their gardens.

—Improvement by Selection and Breeding.—

Although many of our anuals are extremely beautiful in their wild state there have been most wonderful changes brought about in some of the genera and species by cultivators and specialists. Annual plants have been of much more interest to those who have been interested in the improvement of cultivated plants than herbaceous plants have ever been. They have been more easily handled, that is, their habits and forms have more easily responded to the requirements or desires of the improver. On the other hand they have had drawbacks which the improver found great difficulty to overcome in many instances. To get a new habit or new form of flower in annual plants was not the only difficulty the improver or cultivator had to contend with. His time and skill would have been wasted if varieties could not be produced true from seed. Therefore, it is in getting good strains that will come every time true from seed that takes time, patience, and perseverance.

In woody or herbaceous plants this difficulty is much more easily overcome when new varieties have been obtained, as they can be increased in many ways other than by seed, such as by cuttings, grafting, and many similar modes of propagation. Consequently much time and trouble have to be given to keeping true the fine strains of many kinds of our garden annuals. They very soon degenerate and, if not carefully looked after, many of them will revert to their wild state. One would be almost safe in saying that if the skill and labour of our cultivators and specialists were abandoned for a few years, nearly all the good varieties of garden annuals would disappear and be replaced by inferior kinds more like the original wild forms.

Wonderful improvement has been brought about since the garden annuals were collected in their native countries. The time and labour that has been spent on some of these plants is hardly credible. The history and origin of some of the varieties make intensely interesting reading. Some men have spent the best part of their lives improving the species and varieties of one genus. The trial grounds, which cover hundreds of acres, of some of the large seedgrowers in Europe show us what is being done with this class of plants. Take, for instance, the apparently endless beds of annuals at the extensive grounds of the well-known seedsmen, Messrs. Sutton, of Reading, England.

Hardly any of us ever give it a thought when we are enjoying the beautiful plants in our gardens as to how these plants originated. How little credit some men have

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got for what they originated in the plant world! Those who write poetry and novels are always heard about. Men who have produced new flowers and plants which give so much pleasure to the aesthetic side of life, are hardly ever heard about. Those who produce new and improved useful plants are a boon and a blessing to any country.

—Usefulness of Annuals.—

The real merits of annual plants are sufficiently great to render needless any exaggerated statement of their claims. We are all well aware that to many the hardy perennials offer superior attractions, and the lovers of these plants are always sure to lay emphasis on the great trouble of sowing annuals each year. However, the true lover of garden beauty will hardly attempt to estimate by any nice process the comparative merits of the various classes of ornamental plants, but on the other hand should be gratefully thankful for the bountiful supply which has been given him to embellish his surroundings. They possess many advantages, strong points in their favour being the short time required to produce an effect, and the small cost at which a constant display of flowers may be maintained. They are especially easy to grow and their value for cutting cannot be overlooked.

With a good knowledge of the various species and varieties there is no kind of ornamental gardening in the way of borders or beds that cannot if necessary be done with annuals, just as well as with other plants. Many of the failures which have existed with these plants have come about through not knowing the proper kinds to use; to attain results one must know which are best suited for the effects that are desired.

—Importance of Good Seed.—

In my opinion it is always best to buy the very best strains of seed obtainable, even if they cost more. There is less work and care with good fresh seed than there is with cheap, unreliable kinds. The cheap seed needs as much care and attention as good seed does, and never gives as good results. If any one wants to get results buy seeds from reputable seedsmen who have made a life study of the seed business. They can't afford to sell you unreliable seeds.

Many of the annual seeds lose their germinating power much earlier than other seeds, therefore it is very important that they have been freshly collected the previous year. The cheaper the strains the more plants you will get. From the finer and more expensive strains fewer plants are obtained, but one gets quality against quantity. It is said that some of the growers of fine strains of pansy seed sell their products weight for weight, that is, one ounce of pansy seed for one ounce of gold. So it is easily seen from this that fine strains of seed are "worth their weight in gold."

There are no plants easier to grow than annuals, but the ease of culture has got many people into the habit of growing them in a haphazord way, and often they do not get the attention they deserve. To get good results we have to give them just as good care as we give to other garden plants. Then the luxuriance of growth and the plentiful supply of flowers pay us amply for the extra care.

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Tropaeolum Specioeum and its Cultivation.

Among flowering plants having a twining habit of growth, the above-named deservedly holds a foremost position, and anyone on first viewing it in full bloom can scarcely fail to be impressed by its unique and gaudy appearance. The plant is somewhat fastidious as to soil and situation, growing rampantly in one position, while in another but a short distance away the reverse is the case, despite all efforts to supply its requirements. The cool, moist climatic conditions appertaining in general to Scotland are apparently conducive to its well-being, judging by the frequency with which it is encountered in various parts of the country, both in the environment of the stately mansion and that of the humble cottage. Being quite hardy and perennial in growth, the plant, once established in a congenial site, will, in all probability, thrive luxuriantly and continue to increase its area by way of underground root extension for an indefinite period.

Dense shade of other plants, which, by the way, act as hosts to the long trailing growths in the summer season, is not in any way inimical to its progress, but rather the reverse, and the splendour of colour resting upon masses of evergreen is displayed to greater advantage than is possible by any other method of training. Within a few yards of where these notes are penned, a large spreading bush of Rosa rugosa has for several years past in late summer and autumn been almost covered with the growths of this Tropaeolum, its slender tuberous roots being quite able to hold their own in conjunction with those of the Rose in a soil that is distinctly close and heavy naturally, and upon which the sun, owing to the position and over-growth, can exert but little influence at any season. Last winter much disturbance of the root system was carried out to obtain supplies for planting elsewhere; but this appears to have acted beneficially, for not only is the usual growth and floriferousness fully maintained, but, owing probably to the intense heat of the past season, the growths have spread to an adjoining Portugal Laurel some 20 feet in height and have reached its topmost branch, flowering profusely upon this glossy surface, and the situation, being at the main entrance to the principal garden, this conspicuous feature has been much admired.

As already stated, this Tropaeolum will not thrive in every garden, but I think there are but few in which it would not succeed were special care taken in the selection of the site, the preparation of the soil, if such is deemed necessary, and lastly, but really the most important, the time of year and suitability of the plants for insertion in the soil.

In the first instance, a cool rooting medium such as can often be found on the north side of a low wall or hedge, or at the base of some slender-growing shrub, will answer well.

The Treatment of Home Grounds.

A summary of the chief points touched on in a lecture before the Massachusetts Horticultural Society.

Whatever aesthetic qualities they may or may not have home grounds, like the houses they surround, ought first of all to serve as well as possible the practical domestic and social needs of those who live in them. Anything done for beauty or for display that makes it less convenient or satisfactory for the family to do the things they want really most to do, in so far, bad design.

If the head of the family is in the habit of hurrying for the train and is delayed and seriously irritated by an indirect path from the front door to the street or by a plantation of shrubs that prevents him from making a convenient short cut, then those home grounds are for him, in so far, ill designed, no matter how pretty a picture they may present to the eye of un unsympathetic and leisurely artist. The design may be good of its kind and yet be the wrong kind for the owner of the place. If a man has a number eight foot he does not want a number seven shoe, no matter how good it may be of its kind. If there are boys in the family and they want to play around, dig holes and climb trees and behave in general like real boys, then home grounds that are so horticulturally precious that the boys can't be boys without causing serious destruction are, in so far, very poor home grounds for that family. If the mother, without pretending to much skill as a gardener, wants to potter about with plants and try little gardening experiments from year to year it would be a pity to have the only available space occupied by a beautiful shrub-bordered lawn, where the introduction of flower beds would be felt by any person of taste to be inharmonious, or occupied by a formal garden so precisely ordered that any change in the beds would spoil the colour scheme of the pattern.

Of course, there are people who would under no circumstances make any real use of their home grounds except as a means of ingress and egress to and from the house, and as a foreground across which they may gaze from the house at what occurs upon the street or at the neighbours, and across which the house may be agreeably or impressively seen by those passing on the street. For people of such limited powers of enjoyment as these, the problem of home ground treatment is a comparatively simple one; but it is safe to say that of the countless families living on grounds which are laid out without regard to any other domestic or social usefulness than the above, a large majority would get a good deal more enjoyment out of their homes if they had the enterprise and the skill to adapt their surroundings to various other uses suggested by their individual preferences, instead of dumbly accepting a stereotyped pattern of grounds which provides for nothing beyond those few requirements that are common to everybody.

In the treatment of home grounds, then, the first and controlling consideration is to make them conveniently and satisfactorily usable for the particular kinds of things that the family will get most personal satisfaction out of. It often happens that the family or different members of it would like to provide for more different kinds of things than can be got into the space without serious interference; and in such cases it is important to look the facts in the face and choose deliberately what to provide and what to forego, because it frequently happens that people drift into the hopeless undertaking of trying to accomplish two incompatible purposes at the same time and place, with the inevitable result of botching both; as, for example, when they try on the one hand to get the charming simplicity of a quiet informal lawn, and on the other hand try to secure the equally charming but incompatible beauty of gay and striking flower beds by setting out the latter in the midst of the lawn. Some people find it very hard to learn that they cannot have their cake and eat it. But it is a fact that a fair amount of imagination and ingenuity in planning will reconcile a surprising number of different purposes and care for them all on a limited area without practical conflict or artistic discord.

No such combination of purposes exists that has not the possibility of beauty; the beauty inherent in good proportions and in well combined colours, textures and forms; and the beauty of a certain expression or character arising out of these things and out of the suggestions and assosiations called up in the mind by all of them together. The kinds of beauty are infinite in number, and in art it is not so much the kind of beauty you attempt that counts as the success with which you attain the kind you aim at.

First, find the general arrangement that is most serviceable; second, see what kinds of beauty, what general character of pleasing appearance, that arrangement suggests or most perfectly permits; third, try to make the necessary details of the general arrangement emphasize so far as possible and enhance the character thus selected and obscure or minimise any necessary defects or inharmonious elements in it; and finally, be sure that everything which may be added by way of decoration contributes to the same end. No matter how beautiful or how precious a thing may be in itself—whether flower, shrub, or tree, whether fountain, vase, or pergola, whether work of sculpture, architecture, or gardening—it is a blemish to the home grounds if its presence does not enhance the effect of the surroundings in which it is set.

It is probable that a greater number of carefully tended home grounds fall short of excellence through the crowding into them of too many and too varied objects of decoration than from any other cause, and perhaps in no other simple way could so much be done for the improvement of their appearance as by the mere elimination first, of those objects which are more or less distinctly inharmonious with the dominant expression, and second, of those which without being positively inharmonious are encumbering and confusing.

—2. There Should be a Recognition of Functional Divisions.—

The home grounds are bound to consist of one or more principal spaces or divisions, each having certain more or less definite purposes to serve and a more or less definite character of appearance. The boundaries of these divisions may be strongly and sharply marked, as by fences, hedges, or continuous lines of shrubbery, tree foliage, carpentry or masonry; or they may be only sketchily suggested in ways too subtle to be described in words.

Just as it is true in a general way of the home grounds as a whole that they cannot be thoroughly agreeable if they have not a certain harmony and unity of character, so it is true that each of these sub-divisions should be even more closely self-consistent in character. That is to say, on the practical side, it is desirable to keep conflicting uses in separate divisions; to arrange for the handling of garbage, ashes and household supplies in a distinct and separate compartment to that used for the holding of garden parties. And on the side of artistic and harmonious composition it is desirable that all the necessary and the decorative features of the grounds should reinforce each other by suggesting to the eye the same system of subdivision. If the shape of the ground and the arrangement of the masses or lines of tall foliage suggest strongly to the eye the division of a given front yard into two units, one lying to the west and the other to the east, and if at the same time the northerly half of both spaces is used for one purpose and treated as to details of decoration and maintenance in one style, and the southerly half of both divisions is used for another purpose and treated in another style, it must be obvious that the appearance will be confused, perplexing, and disorderly. Now while such an extreme case might be easy enough to avoid, it is evident from the examples all about us that the principle here so grossly violated is in a less striking but equally mischievous way very generally violated. What most frequently happens is that there is so much conflict and confusion that no recognisable units are suggested at all, and the place is a mere patchwork of more or less agreeable details. The simplest way to guard against such a result is to choose deliberately the main subdivisions to be recognized in the grounds, to see that their boundaries are unmistakably indicated or suggested, in placing every utilitarian and decorative object that does not form in effect a part of one of the boundaries, and to have the question always in mind, "Will this thing, so placed, strengthen or weaken the unity of the space in which it occurs and the character which already belongs to the unit?"

In planting, a point frequently overlooked is that objects less than three or four feet high do not interrupt the sweep of the eye over a surface, and that objects which rise to the height of the eye or above it do form such an interruption. Therefore no matter what the character of a given space may be, whether formal or informal, whether garden, courtyard, lawn, glade, or woodland, the eye-height is a very critical height in the objects which occur in that space.

Objects which occur at this critical height and which do not form parts of the boundaries of a main unit must be used very sparingly and with much skill and discretion or they will destroy the unity of the space. Lower objects may or may not improve the character of the main unit, but at least they do not actually prevent one from seeing it as a whole, and they may generally be so arranged as to form or suggest the boundaries of a series of subordinate units which one recognizes as parts of the main unit. People very generally fail to ask themselves, as they should when they plant an insignificant looking wisp of a shrub from a nursery, "Does this kind of shrub grow high enough to prevent us from looking over it when fully grown, and if so, will a barrier to the view at this point be desirable or undesirable?"

The main subdivisions of the house grounds may be few or they may be many, but in nearly all cases it is desirable to distinguish more or less clearly at least three functional divisions.

The first of these is the entrance or public portion, devoted to the ingress and egress of the family and their visitors, to the expression of hospitality and of regard for the enjoyment which may be given by the place to passing strangers and to all who are not taken into the bosom of the family. In terms of the normal suburban lot this is the front door yard. The proportion of the place devoted to these quasi-public functions may be large or small, but some recognition of them there ought to be.

The second is the family or living portion of the place. This may be merged with the first and far too often is thoughtlessly so combined. In a village community where everybody is friends with everybody else, or in cases where people are lonely and eagerly welcome the sight of every passing stranger, or where no true family life exists at all, a family may really find it more agreeable to combine the entrance portion and the living portion of their place in one, just as some people prefer a hotel parlour to a real home; but normally people who have any real family life and any real social enjoyment more highly developed than a mere gregarious instinct like that of cattle and English sparrows, find, as a matter of experience, that it is pleasanter and more civilized to have a portion, often the major portion, of their home grounds more or less completely screened or shielded from the public at large and from the entrance portion of the grounds, and so treated that it may be conveniently and pleasantly used as an integral part of the home, as an outdoor sitting room or series of rooms where one may sew or read or doze in the shade of a tree or play a game of cards or appear in a negligee costume without an uncomfortable sense of wondering what Mrs. Smith will think about it or whether Mrs. Robinson will

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see you and come in to bore you with one of her long-winded visits.

The third division which generally needs to be recognized is that devoted primarily to service operations. There are obvious advantages, which it is needless to rehearse, in favour of not keeping the frying pan and the sink and the slop pails in the dining room or parlour but in a distinct part of the house devoted to such uses especially adapted for them and completely shut off though conveniently accessible from the living part of the house. Similarly it is desirable to provide proper convenient places out of doors for ash barrels, garbage pails and the like, for the incoming of supplies and outgoing of wastes, for the hanging out of washing to dry and other such important, but not pleasing functions arranged so as to be separated from both entrance and living portions.

The clear recognition of these three controlling functional divisions in most home grounds—the entrance portion, the living portion, and the service portion—and the application of a fair degree of ingenuity and taste to the problem of separating them and making each convenient and appropriate in character for its own function would do a great deal toward bringing about that good order which is the foundation of beauty.

◆

The Ivies.

Of all the hardy evergreen climbing plants we doubt whether there is any subject that will compare with the Ivy for real lasting usefulness. Owing to the great and pleasing diversity of its form and habit, varieties of the Ivy may be used on pergolas, garden arches, stumps of old trees, the walls of either dwelling-houses or outhouses and in almost every conceivable way where a permanent covering is desired. Hedera is the botanical name of the Ivy and all the forms now in cultivation have originated from one species, viz., H. Helix which is a native of Europe. The green-leaved climbing varieties with black or yellow berries will grow almost any where, but to do them well preparation of the soil in which they are to be planted amply repays the trouble taken. The ground should be keeply dug and heavily manured, and if old mortar rubbish is incorporated with the soil Ivy will revel in this, as it perfers a soil with lime in it. On the other hand, the beautiful variegated sorts give better results in soils of a poorer nature, rich soils invariably causing the variegation to die out. These variegated sorts are not so robust, in growth.

When planting the Ivy see that the soil is made firm round about the roots, and for the first season the growths should be loosely secured to the walls or fences. All varieties are easily raised from cuttings. If any numbers are required, a piece of ground should be dug over and the surface soil well broken up, incorporating plenty of sand or gritty matter at the same time. Rake over and make fairly firm. This done, proceed to acquire a sufficient supply of shoots of the current year's growth.

Any such shoots should be nicely ripened and all soft growths should be rejected. The cuttings when prepared should be from 6 inches to 8 inches in length. The lower leaves should be trimmed off close to stem. To complete the operation, cut through immediately below a joint, as it is from the base of the latter that the roots are emitted. Pieces of old plants with roots adhering or shoots which have rooted by natural layering may frequently be obtained, and with such material we may proceed at once to plant in permanent quarters, where their future well-being is practically assured.

◆

The Heucheras.

The Heucheras which are dwarf growing perennials belong to the Saxifraga family. They are useful for rockeries, bordering etc., especially when the latter takes the form of a raised stone-supported bank. It cannot be classed as one of the showy plants of the garden but it is nevertheless very charming in its light and graceful habit of growth. No particular attention as to soil or position is required. It grows readily from seed sown either in Spring or Autumn. There are several varieties, of which H. maxima will well repay the grower with a profusion of richly tinted crimson bloom. If mixed shades and colours are preferred a small packet of H. sanguinea hybrida will provide them. All the Heucheras are quite small plants, six to eight inches being about their height limit. When planting out the seedlings should be set about four to six inches apart or seed can be sown where the plants are to flower and afterwards thinned to that distance.

Note Address:

7, ARCADE, ADELAIDE.

Mushroom Growing in the Open.

From "English Garden."

Better Mushrooms can be grown for nine months out of the twelve out of doors than under cover. Visiting a grower a short time since we were assured that he had grown Mushrooms successfully in this way for forty years for sale, and that for many years his average annual output had been between sixteen and seventeen tons.

The first essential is manure from horses bedded on straw and grain fed. If the supply of this is to be collected from one or two horses only, it will take considerable time to collect sufficient to form a moderate-sized bed. The longest of the straw should be shaken out of the manure and reserved (in a dry place) for covering the beds when formed. All the small strawy litter from 6 inches to 9 inches long should be added to the manure to the extent of little more than half its bulk. A cartload of manure will form about a yard and a half run of bed, and on a low average, if all goes well, every yard of bed should yield from 20 lb. to 25 lb. of Mushrooms. In case manure may not be available privately, it may be had cheaply. Fresh horse manure must be stipulated for, as decayed manure is worse than useless for the purpose.

—To Prepare the Manure.—

On the quality of the manure and the way it is prepared depends more than anything else the success of the business. If collected from private stables make sure that the horses have not been physicked during the time the manure is collected, and also that it does not come in contact with any disinfecting fluid which may be used. Let the manure be collected every day and put on one side somewhere under cover to protect it from rain, spreading it on the ground 6 inches to 7 inches deep until a cartload has been collected, when it must be formed into a heap in order to cause it to ferment. Five days after the heap has been put up let it be opened and spread out in order to release the rank gases generated. Put together again in the same way in two hours time, opening it again at the end of three days for cooling purposes, putting it up again for the third and last time for three days, when it must be opened again, by which time all obnoxious gases will have expended themselves and the manure will be ready to form the bed. In the case of manure bought in bulk, the buyer must be more or less in the hands of the dealer, but in ordering it he must be emphatic in insisting on the manure being fresh and stating that it is wanted for mushroom growing. This must be served in the same way as described for the privately collected manure, only it may be heaped up out of doors while in preparation instead of under cover, as long as it is protected from rain by being covered over.

—How to Build up the Beds.—

Measure the ground for the length of bed required, laying down a line and cutting a narrow furrow with a spade, showing the ground the bed should occupy. On this place the manure, spreading it evenly and building up to the required height, treading it with the feet as firmly as possible as the work proceeds (it cannot be made too firm), finishing off by beating the sides as hard as possible with a five-tined fork. Three or four days after the beds have been finished, drive a crowbar down from the top of the bed to within 3 inches of the bottom at distances of 1 foot apart. This is for the further freeing the beds of any foul gases generated and to help to cool them down. In the course of from ten to fourteen days after forming the beds should be ready for spawning. In the meantime they must be protected from rain. The way to find out when the bed is ready for spawning is to insert a bottom-heat thermometer into the bed 6 inches or 7 inches deep. This should be done a week after the bed has been formed, and the temperature watched daily. When first inserted the temperature probably will stand at about 80 degrees, and may go up a few degrees higher, but after a day or two it will begin to fall, and as soon as it falls to 72 degrees is the time to insert the spawn. In the absence of a bottom-heat thermometer an ordinary thermometer will do, burying it from 3 inches to 4 inches deep in the side of the bed near the top. The beds must on no account be spawned while the heat is rising, but always on a falling thermometer. Spawning while the beds are too hot is fatal to success in Mushroom culture.

—Spawning.—

Before describing how to spawn the bed, a word about the spawn itself. In burying spawn obtain the best, as sucess or non-success depends on its quality. It should not be more than one year old, be in a dry condition, and the tiny threads of spawn (the mycelium) running through the body of the brick of spawn should permeate the whole and be very fine in texture, of a dull greyish colour. If this threadlike mycelium is swollen and assuming a whitish appearance, the spawn is not so reliable. The spawn is sold in bricks, in sizes usually of 9 inches by 5 inches. Break these bricks by hand into ten equal pieces. Insert them over the surface of the bed at 8 inches apart and deep enough to allow of the pieces being covered over to the depth of a quarter of an inch by a handful of manure after they have been securely fixed in the bed. The holes to receive the spawn are best formed by a small hand fork or trowel. At the end of a week after spawning the bed is usually ready to be covered with soil. The way to find out whether it is so or not is to examine a few of the pieces of spawn inserted. If a sort of mould is forming round them and slightly communicating itself to the manure, this is a sign that the spawn has commenced its function, and that in good time it will permeate the whole of the bed. The time has now come for casing the surface of the bed with soil. The best soil to use is loam cut from pasture land. It should be sifted through a 1-inch mesh sieve. In the absence of this, garden soil will do if it is fairly light and no manure has been added to it within the last year. Heavy clayey soil must not be used. The soil before applying should be moderately moist, or it will not adhere to the steep sides of the bed. It must be beaten down perfectly firm and made smooth by keeping the back of the spade bright and clean and dipping it occasionally in a bucket of water. The casing should be half an inch deep when batted down. This work completed, all that remains to be done for a time is to cover the beds over with the long litter saved from the manure to the depth of 4 inches or 5 inches. In the course of a month or five weeks, uncover the beds and sweep off the thin coating of mouldy litter which will have been formed and adhering to the surface of the bed, and cover up again. Examine again in the course of a fortnight, and you may reasonably hope to be rewarded with a dish or two of fine succulent Mushrooms. When they have once started bearing, the crop should be picked twice a week will be often enough, and the bed should remain in profitable bearing for six weeks or two months.

—Gathering.—

They should never be cut with a knife. Take hold of the Mushroom by the hand, or a cluster of them, give it a gentle twist to the right and a pull, and Mushrooms, stalks, and roots will come away easily. It is important to remove all the roots of the Mushrooms at the time of gathering, or they will decay and turn that part of the bed sour, to the detriment of those left. It is occasionally necessary to scoop them carefully out with an old knife, refilling the hole made with mould at the same time.

—Points to Notice.—

The manure to form the bed must be fairly fresh and well sweetened by fermentation before being used, and should be on the dry side rather than wet.

Watering.—Mushrooms do not like too much moisture at any time; but in spring, early and late summer and autumn in fine weather they are much benefited by an occasional application when the surface of the beds appears to be dry. It should be applied through a rose, and the chill taken from the water in cold weather.

Covering the Beds. — The amount of covering needed will depend on the weather. When mild from 4 in. to 6 in. will suffice, while in the depth of winter, with, may be hard frost, 1 ft., with an additional covering of mats or tarpaulin, will be none too much. The fact must always be borne in mind that to secure growth in the Mushroom a temperature of from 52 degrees Fahr. to 56 degrees Fahr. must be maintained over the surface of the bed.

The Time to Expect Mushrooms after Spawning.—In this matter beds are sometimes very erratic. It occasionally happens that beds spawned in the autumn remain barren all winter and afterwards give splendid crops in spring, so if the beds sometimes fail to yield a crop when inspected, be generous and give them time.

Spent Manure.—In considering the cost of growing Mushrooms in this way, it should be remembered that the fertilizing qualities of the manure for garden and farm purposes is nearly as great when done with for this purpose as it was before.

Home Vegetable Notes.

Seeding of cabbage, cauliflower etc., may be put out, they will want looking after. I prefer to prick out in boxes or seed bed a few inches apart. This tends to make root growth instead of top and when such plants are put out they grow right away. The soil in these boxes or beds should be shallow say four inches on a bed of ashes, you don't want deep rooting at this stage. I like to get in a row or two of peas by the middle of Febuary. The ground should be deeply dug, well manured and mulched. The seedlings must be kept growing without a check. This does not mean too much water but just enough. Its a bad plan to accustom any plants to too much water, they seem to develope an unnecessarily big thirst. It is a case of the more they have the more they want.

Small sowings of carrots, turnips and parsnips should be made sowing turnips is of course a bit of a lottery this month but worth trying. For spinach I am sowing prickly as a main crop with a bed of New Zealand spinach, a much under valued vegetable, and white beet for variety. A little celery seed should go in this month. In potatoes I am planting some Beauty of Hebron Early Rose and Pink Eye, the last I have found one of the very best all round potatoes. With me it is hardly, prolific and of excellent flavour though the latter quality is of course a matter of personal preference. Plant the sets fairly deeply and mulch the bed if the necessary material can be spared, if not, keep the hoe going. Onions for pickling and various suitable salad plants about completes the list of sowing and planting for this month. A row or two of Canadian Wonder beans can be put in with advantage if the supply looks like running short. With tomatoes and summer stuff generally, it is simply a case of water, hoe and liquid manure. Bordeaux mixture is a great help if any fungus disease gets at the tomatoes but judicious, that is, liberal but not excessive watering; keeping the plants off the ground and all damaged fruit picked at once will generally keep any trouble of that sort away. For general work deep digging is excellent personal exercise and an admireable preparation for future crops.— By E. J. B.

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Harcourt Experiments on Manuring of Fruit Trees.

(By Agronec.)

Perhaps the most complete series of experiments on the manuring of fruit trees, which has hitherto been undertaken in Australia, is that commenced in the season 1904/5 in Mr. R. E. Warren's "Glenthorpe" Orchard at Harcourt, Victoria.

This is a sound young commercial orchard of about 10 acres of bearing trees, and the owner, Mr. R. E. Warren, is a son of the well-known orchardist, and authority on fruit-growing, Mr. J. R. Warren, F.R.H.S., of Cairn Warren, Harcourt. Mr. R. E. Warren has therefore, been brought up to fruit-growing, and fully appreciates the importance of manurial experiments designed with a view to ascertaining which fertiliser or combination of fertilisers will return to the growers, the greatest profit. As his orchard is young, being hardly yet in full bearing, and as the area under working by Mr. Warren is not too great to prevent him from devoting the closest attention to its management, it is peculiarly fortunate that under an arrangement with Mr. J. M. Hattrick, F. H. A. S., N. D. A. the Australasian manager of the Agricultural Offices of The Potash Syndicate, Mr. Warren has been enabled to carry out this experiment on exact scientific lines, and in the great detail shown in the table of results given below.

The soil on which these experiments were carried out, is a light sandy loam of medium quality, resting on granite formation; the land has a western exposure, and the drainage is good. The orchard is situated at an elevation of about 900 ft., and the trees were planted in 1900 on the square system; the cherry trees at 18ft. apart, giving an average of 134 trees to the acre, and the apples and pears at 24 ft. apart, giving an average of 75 trees to the acre.

Both apples and cherries came into bearing in the year 1906. They were first manured on the 30th day of September, 1904, and have been manured regularly every spring since.

On the apple plots the following varieties are represented :—

Rome Beauty, Pioneer, Munroe's Favourite Schroeder, London Pippin, Stewarts Seedling, Rymer, and Cleopatra.

The manure plots are laid off at right angles to the rows of each variety, so that on each manured plot, the same number of trees of each variety is represented. The yields have been recorded in an exceptionally careful manner; the fruit being picked into cases marked with the number of the plot, and the variety. Indeed, so carefully was the work of keeping the fruit separate done, that this was extended even to the marketing, and Mr. Warren is thus able, from his records to see exactly what price the fruit from any given plot and any variety on that plot, fetched in the open market. It will be seen from this, that everything possible in the way of attention to detail, has been done to secure reliable and trustworthy results. The soil is uniform throughout all the plots, except No. 6, which is slightly wet, and has been rejected for this reason. The treatment, in respect of cultivation, and also as far as possible of pruning, has been uniform throughout the whole series of experiments. The manures have been applied with the utmost care to avoid any mistakes. Finally, during the period under review, the whole area has once received an application of lime in the carbonate form, and once also field peas have been sown during the autumn and ploughed under in Spring, as green manure. This was done on all plots, manured and unmanured alike.

The following table shows clearly the plan of experiment and the yield of fruit recorded per acre in bushel cases :— (See next page.)

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RESULTS OF EXPERIMENTS ON MANURING OF APPLE, PEAR, AND CHERRY TREES.

Carried out by Mr. R. E. Warren, Glenthorpe Orchard. Harcourt, Victoria.
Manuring per Tree.

"A" from apples for 4 seasons. "B" ,, pears for 3 seasons. "C" ,, cherries for 2 seasons.

Kind of Crop and Season.	I. No Manure.	II. 2lbs. Super. ¾lb. Sul. Am.	III. 1lb. Sul. Pot. 2lbs. Super.	IV. 1lb. Sul. Pot. ¾lb. Sul. Am.	V. 1lb. Sul. Pot. ¾lb. Sul. Am. 2lbs. Super.	VI. 1lb. Mur. Pot. ¾lb. Sul. Am. 2lbs. Super.
APPLES. (Plot—30 trees).	Yield per acre. (bush. cases.)	Yield per acre. (bush. cases).	Yield per acre. (bush. cases).	Yield per acre. (bush cases.	Yield p. acre. (bush. cases)	Yield p. acre. (bush cases)
1908	29	29	38	30	32	18
1909	50	90	100*	75	110	100
1910	23	77	140	140	144	—
1911	30	50	57	57	100	50
Total	132	246	334	302	386	168
Average 4 years.	33	61	84	76	96	56
PEARS. (Plot—10 trees).						
1909	45	37	45	22	67	67
1910	75	75	225	150	300	300
1911	75	90	150	112	225	225
Total	195	102	420	284	592	592
Average 3 years.	65	34	140	95	197	197
CHERRIES. (Plot—10 trees).	(half cases)	half cases)	(half cases)	(half cases)	(half cases)	(half cases)
1907	135	135	135	135	270	270
**1908	—	—	—	—	—	—
***1909	135	270	270	405	810	575
Total	270	405	405	540	1,080	845
Average 2 years.	135	202	202	270	540	422

*Mr. Warren reported in 1909 that "The Mixture of Potash and Super is the best manure for Apple trees, giving better colour and quality

**No manure applied to these plots in spring, 1908.

***Yields not recorded in Season 1908. Fractions of cases are omitted throughout.

FINANCIAL RESULTS OF APPLE EXPERIMENT.

No. of Plot.	Value of Average Annual Increase over Unmanured. £ s. d.	Annual Cost of Manures. £ s. d.	Average annual Profit from Manures. £ s. d.	Profit from Potash added to Incomplete Manure. £ s. d.
1				
2	3 10 6	0 15 6	2 15 0	
3	6 7 6	0 18 8	5 8 10	
4	5 6 10	1 1 2	4 5 8	
5	7 18 1	1 7 8	6 10 5	3 15 5

This table shows at a glance that the manure applied to Plot 5 constituted the most profitable mixture of fertilisers for apple trees under the conditions under which the experiment was carried out. These conditions, it must be remembered, are very typical of a great area of land devoted to fruit culture in Australia, namely, a light sandy loam, derived from a granitic formation and resting on a clay subsoil.

As the trees became older, the manurial dressing was slightly increased, for the first time in the Spring of season 1910-11, when the dressing applied to Plot 5. was made up as follows :—

1½lbs. Sulphate of Potash per tree.
1lb. Sulphate of Ammonia per tree.
3lbs. Superphosphate per tree.

The increased cost of this dressing has of course, been taken into account when calculating the cost of the manures applied throughout the experiments.

Further reference to the table will show that the next most profitable plot was Plot 3. On this plot, the manures used furnished only the two plant food ingredients potash and phosphoric acid, and the financial results therefore show that the land was in greater need of potash and phosphoric acid, than of either nitrogen and phosphoric acid, or potash and nitrogen.

Speaking generally, it may be mentioned that where green manuring is regularly practised, say every two years, and a dressing of lime given say every third year, the Plot 3. mixture is a very suitable one for apple trees and one which will return very handsome profits to the grower. It consists, for ten years old apple trees, of :—

1½lbs. Sulphate of Potash per tree.
3lbs. Superphosphate per tree.

Another interesting fact brought out by the figures is that potash was the manurial ingredient most needed in the soil. If we deduct the net profits of Plot 2 from those obtained on Plot 5 we find that plot 5 returned to the grower

£3 15/5 per acre per annum more than did plot 2. This increase, it must be remembered, was due solely to the potash added to plot 5. Deducting Plot 4 from Plot 5., we find that the difference due to phosohoric acid is equal to £2 4/9. per acre per annum.

We therefore see, as already mentioned, that the plant food ingredient which paid the grower best, was the potash. This is a fact which should be carefully borne in mind by every practical grower who reads this article.

To consider in the same way the financial results of the experiment with pear trees, attention is now directed to a similar calculation of the

FINANCIAL RESULTS OF PEAR EXPERIMENT.

No. of Plot.	Value of Average Annual Increase over Unmanured.	Annual Cost of Manures.	Average annual Profit from Manures.	Profit from Potash added to Incomplete Manure.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1				
2	Decrease	0 16 1	7 0 1	
3	15 0 0	0 19 3	14 0 9	
4	6 0 0	1 1 10	4 18 2	
5	26 10 0	1 8 7	25 1 5	32 1 6
6	26 10 0	1 8 7	25 1 5	32 1 6

The out standing feature in this result again is the remarkable return derived from the potash. The table of complete returns shows that the application of phosphoric acid and nitrogen only resulted in a loss, which amounted each year, when compared with the unmanured plot, to £7 0/1. per acre. The mere addition of potash however, converted this annual loss into an annual profit of £32 1/6. per acre.

In the pear experiment, the land was very uniform throughout, so that there was no need to reject any of the plots and so far as the pears were concerned, Muriate of Potash gave returns just as profitable as did the Sulphate. In both the apple experiment, and as will be seen also the cherry experiment, the profits from Sulphate of Potash were decidedly greater than from the Muriate.

In the pear experiment again, a mixture of potash and phosphoric acid was about 3 times as profitable as a mixture of potash and ammonia, but even more markedly than in the apple experiment, did the complete manure prove the most profitable.

Under similar conditions there need therefore be no hesitation in using as a dressing for pears, the following combination :—

STANDARD DRESSING FOR PEAR TREES.

10 years old.

1½lbs. Sulphate of Potash per tree per annum.

1lb. Sulphate of Ammonia per tree per annum.

3lbs. Supherphosphate per tree per annum.

Where green manuring is regularly practised, the ammonia in this mixture may occasionally be omitted.

Lastly, to consider the

FINANCIAL RESULTS OF CHERRY EXPERIMENT.

No. of Plot.	Value of Average Annual Increase over Unmanured.	Annual Cost of Manures.	Average annual Profit from Manures.	Profit from Potash added to Incomplete Manure.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1				
2	8 8 9	1 5 9	7 3 0	
3	8 8 9	1 10 0	6 18 9	
4	16 17 6	1 13 3	15 4 3	
5	50 12 6	2 4 6	48 8 0	41 5 0
6	35 18 9	2 4 6	33 14 3	26 11 3

Here again we have at first glance, the overwhelming superiority of the complete manure in which potash is given in the form of Sulphate. Sulphate of Potash applied to cherries in this experiment was on the average of three years, more profitable by, in round numbers, £15. per acre annum, than the Muriate. Both forms, however, proved very satisfactory as an addition to Superphosphate and Suphate of Ammonia, because, while the Superphosphate and Sulphate of Amonia returned only an annual profit of £7 3/- per acre, the complete manure with potash in the form of Sulphate, returned an annual profit of £48 8/- per acre.

In the cherry experiment, the ingredient most deficient was first of all the nitrogen. The next ingredient most deficient was the potash, and the one which gave the smallest profit, that is to say, was from the Orchardists point of view, least deficient, was the phosphoric acid.

To summarise in a word the results of all the tests, it has been conclusively shown by these experiments, which the writer ventures to assert are the most comprehensive and complete hitherto carried out on the manuring of fruit trees in Australasia, that the manurial ingredient which returns by far the greatest profit to the grower, is with the three classes of fruit experimented upon, the potash.

The significance of this result is of the very first importance to fruitgrowers. Ten years ago, comparatively few fruitgrowers used potash regularly, to many it was unknown. Even today many fruitgrowers never think of using potash although they apply regularly phosphatic and nitrogenous manures, such as, bonedust, superphosphate, Blood and bone mixture green manure, and so on, but none of these manures contain any potash, while all fruit crops very rapidly deplete the stores of available potash in the soil. No fruit-

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grower who omits potash, either as Sulphate or Muriate from his mixtures, can possibly get the maximum returns from the manures he does use. If he doubt this statement, let him consider well the results in figures above stated, and ask himself whether he can afford to remain unconvinced, when for a trifling outlay of 15/- he may secure an increased crop worth any thing from £3. - £30.

◆

Watering Fruit Trees.

Many amateur growers do harm to their trees by over watering. Of course it is done with the very best intention but it is a mistake. Water is a help while the fruit is increasing in size, but not after it is fully grown. When this stage is reached decay commences, the ripening of the fruit being the first step in this direction. Water supplied after the fruit attains its proper size causes deterioration in quality and keeping properties. It is also injurious to the trees by causing a prolonged growth of wood and preventing its early maturing. Trees that have brought their crops to maturity and have made a fair growth of young wood have finished their work for the season. They require no further excitement, but should be allowed to rest and recuperate for the next season, for it is probable that this thorough ripening is the most important factor in the following season's crop production. The citrus family and other ever-greens require somewhat different treatment, as they are always in a more or less active state of growth. These trees require supplies of water at all times of the year, but more particularly in the summer, when nature is somewhat niggardly, and should never be allowed to suffer through lack of moisture at their roots.

◆

A Valuable English Apple.

A recent issue of "The Garden" illustrates the apple Ard-Cairn Russet in colour and writes "There is an element of romance about the latter-day history of this excellent dessert apple, the merits of which are sufficient to justify us in presenting a coloured supplement of it with this issue. Two years ago we received fruits of this and several other old Irish Apples from Mr. Baylor Hartland of Ard-Cairn, Cork, and at the time were very much impressed by its attractiveness, crisp flesh and unique, sweet flavour. Last year, when Mr. Hartland exhibited fruits before the fruit and vegetable committee of the Royal Horticultural Society at Westminster, this high opinion was endorsed by the committee granting it an award of merit.

This beautiful apple, which for many years seemed to have been overlooked, was discovered some twenty years ago in an old Irish garden by Mr. Hartland, who happened to be spending Christmas in the country at a friend's house, and the Apple was produced with the after-dinner fruit, its peculiar and pleasant, Banana-like flavour being commented upon. Its history was immediately taken up by Mr. Hartland, but no evidence could be found save that of one tree in the orchard. Previously the owner had sent fruit to many leading English nurserymen, all suggesting imaginary names, but none definite. Then Mr. Hartland, having worked up a stock of it, sent fruit from the young trees to Messrs. John Wright, V.M.H., and Owen Thomas, V.M.H., neither of whom recognised it, but the former suggested the name which it now bears. It is an Apple with a shape, colour and exquisite flavour of its own, and is a valuable addition to the present list of first-class dessert Apples. In many parts of this country, as well as in Ireland, there are, no doubt, a number of excellent Apples, not in general cultivation, which, in these days of strenuous living, are liable to be lost.

◆

Ants Attacking Fruit Trees.

A correspondent writes :—"In your letter of the 16th November you were kind enough to express an interest in my "Ant" trouble. You doubted whether the ant was not being wrongly blamed for attacking fruit, where the skin had not already been broken by something else. I have watched very closely this season and am quite sure they have the necessary enterprise to start business without any outside assistance. I am sending you an example of their work (peach herewith) this represents about two days' work. London Purple round about the stem of the tree seems to get rid of the trouble, but in every tree where this has not been applied they get busy as soon as the fruit is fully grown and while it is yet quite hard." Is this not a somewhat unusual experience. We have always regarded ants (in moderation) as rather friendly little scavengers in the fruit garden. Has any other reader had reason to add the industrious ant to the long list of insect enemies?—Ed.

BOT FLY.

This is the time of the year that horses are restless with the Bot-Fly nuisance. A conspicuous red neck-tie keeps the Bot at a safe distance I've heard; but I think a little carbolic oil rubbed on under their jaws (the horse's, not the Bot's) seems to be effective. Try it theres no harm in it. —Bot.—

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How To Grow Good Carrots.

To grow good sized carrots of excellent shape is, or ought to be, the aim of every gardener, because there are very few households indeed where the roots are not required, and the growing of shapely solid roots is a moderate test of an amateur's proficiency in vegetable culture. The ideal soil for carrots is one that contains a preponderance of sand; but good roots can be grown in almost any soil providing it is well cultivated and the proper types are selected.

As stated above, very much will depend on work previously done, and this work consists in digging the soil deeply and working, if the ground is poor, some well-decayed manure in the bottom spit. A better system is to select a site that was well trenched and manured for a previous crop and, where this exists, all that will be necessary now is to fork it over a good spit deep and allow it to remain a week or two to settle.

To fully prepare the bed the surface must be well firmed. Then rake the surface level. For this crop, as for most others, the most convenient method is to sow in drills, as weeds can then be easily kept down by means of the hoe. As a general rule, 12 inches from row to row is none too much for the long rooted types, but 9 inches will suffice for the stump-rooted varieties. These drills should be made 2 inches wide and flat at the bottom, 1 inch deep being sufficient. Many beginners make the mistake of drawing the drills wedge shaped, so that when the seed is sown only a very narrow line is made, the result being a crowded mass of seedlings. With the flat-bottomed drill this is avoided, the seeds being scattered thinly all over the bottom and covered in with nearly 1 inch of fine soil. Lightly rake the surface level, and finally make the whole firm, for carrots delight in soil that has been moderately compressed.

With the seedlings, which are rather slow in appearing, will also come weeds, and these must be removed as soon as possible, else, being of quicker growth, they will smother the young carrots. Hoe well between the rows, and when the plants are large enough to handle, thin them so that each stands 2 inches from its neighbour. When large enough for cooking alternate roots must be drawn out so that each of those remaining stands 4 inches from the next. In thinning care must be taken to promptly fill up all holes that are made, firming the soil at the same time. Useless thinnings, too, should be removed and burned, instead of being thrown down on the bed as is frequently done.

Where the soil is very heavy the addition of burnt earth, road scrapings, leaf-mould or similar substances will be of great assistance. On heavy soil the long rooted sorts ought not to be grown, stump-rooted varieties giving much better results. Where the soil is very sticky or clayey good roots can be grown by making deep holes, 4 inches apart in the rows, with a crowbar, filling these in with good lighter soil and sowing the seeds therein. When the seedlings appear, thin so as to leave one at each station.

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Climatology and Soil in their Influence on Fruits.

Extracts from a paper read by Prof. T. H. McHatton, of the Georgia Experiment Station, published in the Proceedings of the Georgia State Horticultural Society.

The effect of climate and soil upon fruit is a subject on which we have very little definite data. There are a few things that we know from observation, yet when we come down to the fine point of the why and the wherefore it has not as yet been worked out. And on the other hand, every man thinks that his section raises the best fruit. To be thoroughly familiar with the subject, one must have studied the conditions of, and, if possible, been in, all the fruit growing districts of the country, for it is out of the question to find the multifarious types of soil and climate in one place. A paper of this kind will naturally fall into two divisions: first, the effects of the soil, and those of the climate.

Soil, as we all know, is formed of disintegrated rock, with an admixture of organic matter. The kind of rock broken down determines the type of soil, that is chemically. We need not deal at any great length with the chemical constituents, as it is known that nearly all soils, except pure sand, contain enough plant food to sustain life; still, often one particular element is in excess of the normal and when that is the case we may safely look for some marked effect upon vegetation. Our main theme for the present must be of the mechanical characters, as it is easy for one to pick up a handful of soil and tell whether it is clay, loam or sand, whereas to find the chemical element requires a laboratory and a technical education. We also know that there is a co-relation between the mechanical type and chemical make up.

Let us first consider the clay, our heaviest type. Its fundamental element is aluminum, the particles are small and capable of holding large quantities of water. The main effects of a heavy soil are to give a long-lived, large tree, retard ripening and prevent too luxuriant a growth. Very few fruits, indeed, are adapted to the heaviest clays; practically the only one is the pear, and it is a question whether it does not do better on a heavy loam.

Taking up next the lightest soil, we know that on the pure sands practically none of the tree fruits are adapted. Peaches and possibly citrus trees thrive better on very light lands than any other. A mixture of sand and clay makes a loam, the amount of the composing elements, determining the type, whether clay, sandy or medium. It is upon these soils that we find the greater number of fruits, and therefore have more of an opportunity to study the effects of this type.

We will deal with the soil as affecting the peach first. It Is known that the tree attains a greater age upon the heavier loam. It, however bears sooner and the fruit ripens earlier on the lighter, sandy soils, though on the latter they also deteriorate more rapidly. It is thought that a mellow loam will produce finer, richer-flavored fruit than other soils, though the best color, as a rule, is found on the sandy lands, with the clay giving the poorest. These conditions will not hold true, though, for all localities. Oftentimes a chemical will predominate and affect the fruit perceptibly. Too strong an alkali or acid will produce death on the other hand, an element in excess may give satisfactory results. Whenever an orchard is located on a soil rich in iron or manganese the fruit colors up in an exceptionally fine manner.

The plum, differs greatly from the peach in its soil requirements. This fruit and the apple are most adaptable and seem to be affected less by soil than any of the others.

The apple seems to be less affected and will do better on a greater variety of soils than any other fruit unless it is the American plum. The longest-lived trees are found on the heavier soils; a favorite is a stony loam of calcareous nature. It has been found that calcium or lime will help the keeping qualities of this fruit. Whether the same effect would be produced on all varieties is a question. A stony loam on a gravelly sub-soil has been observed to give the largest and best-flavored fruit and some varieties on a sandy or gravelly soil color on better and ripen earlier than on others. Light soils, however, are apt to produce too soft a growth of wood, which is liable to winter injury; on the heavier soils the wood is hardier and usually passes through the cold season better.

We need only mention the pear, as it has not attained any great prominence with us. This fruit thrives on heavier soil than any of the others, the lighter lands making too rapid a grower which is susceptible to blight. It has been found that of all the fruits the pear will stand more alkali than any, and the heavier the soil, the greater amount of alkali does it take to injure it. It might be said in passing that the danger point of alkali for vegetation in the arid districts is about .05 per cent. and that .1 per cent is almost sure death.

Having said as much on the soil effect and adaptability as time will allow, we will now pass to a discussion of climate. By climate we mean meteorological changes taking place in the atmosphere, such as temperatures, rain, humidity and wind. The effects of temperature are in many respects obvious. Heat forces the protoplasm into activity, while cold stops it or holds it back. The effects of more cold than a tree is prepared to stand at any time during its life are well known. The buds may be killed in the winter, the crop may be ruined at blooming time or after by frost.

Now, have we any way to determine the temperature limit of the distribution of various fruits. On Page 54 of Bulletin No. 10 of the Biological Survey, U. S. Department of Agriculture, we find the following:

"The northward distribution of terrestrial animals and plants is governed by the sum of the positive temperature for the entire season of growth and reproduction, and the southward distribution is governed by the mean temperature of a brief period during the hottest part of the year."

Does this help us in determining how far north or south a given fruit may be grown? Not at all, for temperature is varied so, through altitude, exposure and the like, that each fruit must be separately tested to find out whether it will live and

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as a general rule, fruits are of better quality as one approaches the equator. This, however, does not hold true for the apple, for it improves in every way as it goes north. It is thought by some that the moderately warm days and cool nights of New York, Michigan and localities further north, just at the time apples are ripening, helps to make them color up. How much of this is true, no one can say. It is simply a theory. We know that in the north fruit trees are usually larger and longer-lived than in the south; and that a fruit of late season becomes earlier and earlier as it approaches the south, until finally a winter apple, if it can be successfully grown near enough to the equator, becomes a summer fruit.

The less the extreme of heat and cold, seemingly the better the fruit as to health, vigor and regularity of crops. This is shown by the condition of orchards near large bodies of water, which bodies equalize the temperature. Another point of interest is the effect of slope on temperature. A northern or western exposure always gives late maturity, whereas an eastern or southern slope hastens growth. This is of especial importance where we are apt to have late spring frosts.

Let us take a definite example of temperature effect. Hoffman concludes after many years of investigation, that there is a definite amount of heat necessary for a tree to attain a given phase of its year's growth, that is, the sum of the positive maximum temperatures of a thermometer fully exposed to the sun, from January 1st of any definite time, as blossoming, ripe fruit, etc. is the same for each year. In other words, we have a thermal constant that will satisfactorily coincide from year to year. Now this season at Experiment we were some ten days ahead of last year and still, we did not have the warm weather in the winter. Why was it so? The mean maximum temperature for March, 1907, was 67.70 degrees. There was only one day of 80 degrees and that was the 30th, whereas in April, 1890, the mean maximum was 75.03degrees, there being eleven days ranging from 80 degrees to 84 degrees and seven of these came before the 15th of the month. These temperatures were taken in the shade and are therefore only relative. However, we may safely attribute our early season to the seven hot days that came before April 15th, 1908.

Has the theory of the thermal constant been of any practical service? Not as yet, but if at some time it is worked out for the majority of varieties we will be able to tell in a measure where a fruit can be grown and when to expect it to ripen.

Our next consideration will be rain. Too much water causes death, as does too little. Dampness also renders the trees more liable to attacks of fungi and other diseases; it produces too much wood and in other ways injures the crop. The greatest danger from rain comes at blooming time; it prevents fertilization by diluting the secretions of the stigma, dampens pollen, oftentimes causing it to burst. Cold rains are much more injurious than others.

In sections where rain rarely falls during the growing season, such as the arid regions of California, and where the proper amount of water is given through irrigation, there is an exceptionally fine looking and shipping fruit produced. The humidity is low and the temperature high, which seem to be conducive to the formation of a firm and good-coloured product.

Cloudiness, a factor that goes hand in hand with rain, also produces its effect.

Referring again to the arid regions: They have about 230 clear days, which are mostly during the summer season, whereas with us there are something like 150, being scattered from January to January. It is a pretty well acknowledged fact that the amount of light and sun a fruit gets while growing has a marked effect upon the color. Some sections have had a a good example of this this year, as rain has been scarce in some parts of the State and the fruit exceptionally well-coloted in those localities.

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Pulping Fruit.

The following has been recommended as a successful method of pulping fruit: The process, as far as our experience goes, is quite right theoretically, writes Town and Country, and in the hands of a careful man, should give good results. The fruit (previously prepared in the usual way) is put in a suitable vessel, and water added to the extent of a gallon to 3cwt. of fruit. Watch carefully until the mass begins to boil, and keep boiling for 20 minutes from time of first boil. Unripe fruits, of course, will need more cooking, and it is obvious that watery fruits require little or no water. Some fruits are so watery, that water may almost be dispensed with, but great care must be taken that the pulp does not burn. Constant stirring, no matter whether water is used or not, must be insisted upon; burned pulp is of no value from a commercial point of view. When sufficiently cooked, put the pulp into perfectly clean tins, and solder these while the pulp is still hot, filling each tin to the brim. We have seen excellent specimens of fruit pulped in much the same manner as jam and other preserves are canned. In this case, the fruit is cooked in tins. The fruit and sufficient water are put in the tins, and the tops are soldered on, a pin hole being made in the centre of each cover. The tins are placed in water as deep as possible, just so that the water in boiling will not enter the hole left as an air escape. The same time as before is allowed for cooking, when a drop of solder is put in the pin hole to hermetically seal the tins. With this process, we should not recommend the employment of tins exceeding 10lb. capacity, as the expulsion of the air from larger ones causes a sinking in of the tops, etc., which might damage prospects for sale.

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The Farm

Injuries To The Cow's Udder.

When a cow comes up from the pasture with one of her teats showing an ugly gash with ragged edges and coagulated blood, there are some important things to be done, and some other things that should not be done. For instance, it is wrong simply to take it for granted that nature will perfectly repair the injury, and therefore assume that nothing need be done to help, and it is much worse to deem something necessary, and confine the treatment to daubing the wound with dirty axle grease or rancid lard.

Yet this is a common treatment given by the farmer, and when the case goes from bad to worse, or the wound heals but leaves a "pipe" which discharges milk at milking time, the owner is apt to blame his bad luck for the aggravated or undesirable condition, instead of understanding that lack of proper attention and medication is the true cause. In a case such as we have mentioned, the first step should be to perfectly cleanse the injured part, using a warm 1-100 solution of coal tar disinfectant, or 1-2000 solution of bichloride of mercury, easily prepared by dissolving druggists' bichloride tablets in water.

At the same time, all ragged edges should be trimmed smooth, and all shred and foreign bodies removed, to get the wound into good condition for the healing process which will be conducted by Nature. When this has been done the wound should not be stitched. Putting stitches in the lips of the wound simply makes a number of new wounds of small size, but each of them likely to become infected, filled with pus, and after a time allow the suture threads to tear out, making a number of unslightly slits which aggravate and render perfect healing less likely to take place.

Instead of using stitches, dust the wound with an antiseptic dressing powder such as a mixture of one grain of iodoform and three parts each of boracic acid and subnitrate of bismuth. This application will kill germs possibly present in the wound, and prevent germs from growing therein, and so Nature will be given a proper chance to perfectly carry on the work of repair. Bandaging the teat should be the next step, and it is to be done from tip to udder by putting on a strip of surgeon's plaster just as one would apply a bandage.

First the plaster is heated to make it sticky; then it is wound evenly into place, turn after turn commencing at the end of the teat and continuing up past the wound, until all of the teat has been covered and protected. The wound is now guarded against the entrance of germs; its edges are held together by the plaster; rest is ensured, and Nature rapidly mends matters. Were the wound left open, dirt and germs would enter constantly, and milking would aggravate the condition, so that healing would not readily take place.

Protected by the bandage or plaster, nothing can enter the wound, and the teat may be handled as soon as the plaster has cooled off. At first the milk should be drawn off with a clean milking tube, but in two or three days milking can be done by hand without disturbing the bandage, and in 10 days the plaster may be removed, and the wound then will, in most instances, be found healed.

We have advised the use of a "clean milking tube." This is all-important. A dirty milking tube is an abomination and a common cause of infection of the udder and ruinous inflammation resulting from the germs so introduced. Few dairymen use clean milking tubes, for they have happily escaped the experience of aggravated cases of udder disease caused by infection or more often never imagined that the tube was the cause of the aggravated cases of "garget" so often experienced among dairy cows.

A clean milking tube is one that has first been boiled thoroughly, and then well baked in a hot oven. It is not enough to immerse a milking tube in a carbolic solution or other effective disinfectant. The blind end of the tube carries in the germs, and they will do their damaging work, despite the use of antiseptics. Cleanse the tube; boil it; bake it; then immerse it in the antiseptic solution until used, and depend upon it that there then is little danger of having the tube carry infection.

Despite all that can be done, some torn wounds of the teat will on healing leave a pipe or sinus through which milk escapes at milking time, and the owner is at a loss what to do with such conditions. In simple cases, as, for instance, where the pipe or "fistula," as it properly is termed, connects with a rudimentary milk gland, or, in other words, has not been caused by an injury, a few coats of flexible collodion applied, as a varnish, as required will stop the milk flow at milking time, and

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when the cow is dry, the duct of fistula may easily be obliterated by cauterization with caustic, or the thermo-cautery, or even a red hot knitting needle.

It is a much more difficult matter to close a fistula due to a barb-wire cut or similar injury, and the attempt should not be made while the cow is milking. When she has dried off, cleanse the parts thoroughly, then cut away the edges of the wound with a sharp, clean scalpel right down to a clean milking tube, previously introduced, and when this has been done use dusting powder freely, and at once bandage with surgeons plaster. This treatment often proves effective, but in extra bad cases the expert surgeon should be employed to operate.

The lesson to remember is that the troublesome fistula of the milk duct most often follows improper treatment of the teat, and by following the simple preventive treatment we have outlined above, not only will the wounds heal speedily, but a majority of the fistulous conditions will be prevented. — Wisconsin Experimental Station.

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Stumbling and Forging.

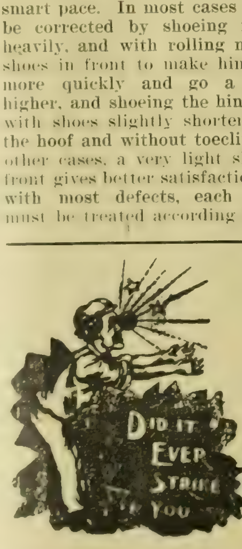
Stumbling may be said to be due to three causes, viz., weak knees, low action, or sluggishness. Horses with weak knees, either from congenital conformation or hard work, are, unless of exceptionally active disposition, prone to stumble. Horses of quite low fore action are prone to trip or stumble over slight obstacles, hence are unsafe except on level ground. Horses that are lazy, sluggish, and inclined to loaf are also usually inclined to stumble. From whatever cause, the fault is very hard to correct, and, we may say, cannot be corrected, but may be avoided by constant care on the part of the driver by keeping the horse well in hand and overcoming sluggishness where it exists by compelling the animal to "drive to attention" at all times. This to the average horseman makes driving or riding a labour rather than a pleasure. The use of a tight check-rein removes to some extent the tendency to stumble, but many stumblers will stumble even under those conditions. Stumbling usually occurs when the horse is moving at an ordinary road gait, and if he is taken well in hand and driven smartly he will go safe; but no horse can stand constant driving at such a gait. In some cases shoeing heavily, with rolling toe action, will prevent stumbling, but in most cases shoeing of this kind, while it causes high action while going fast, does not when going slow, but may even have a tendency to make the action more sluggish. On this principle, light shoes should correct the fault, and in some cases do. As in most defects in action, what will have a tendency to prevent stumbling in one horse may increase the fault in others, hence each animal must be treated according to his individuality.

By forging is understood the striking of the shoe of the fore foot with that of the hind one. This fault, while possibly not interfering to any marked extent with the horse's usefulness, is very irritating to the driver or rider, and very objectionable. While it is occasionally noticed in horses of all conformation, it is more commonly seen in those with very short backs. It is usually noticed at the ordinary road gait, and seldom heard when the horse is either walking or trotting at smart pace. In most cases it can be corrected by shoeing rather heavily, and with rolling motion shoes in front to make him pick more quickly and go a little higher, and shoeing the hind feet with shoes slightly shorter than the hoof and without toeclips. In other cases, a very light shoe in front gives better satisfaction. As with most defects, each horse must be treated according to his peculiarities of action.—Farmers' Advocate.

◆

Indigestion in Horses.

Indigestion is a trouble which many horses suffer from; but the cause is not invariably attributable to the condition of their teeth, as bad feeding or even a constitutional predisposition are both very often responsible for attacks. Loss of appetite and sometimes a desire to eat objectionable substances are common symptoms of indigestion, which, if not properly treated, may become chronic. Very frequently diarrhoea affects the horse, and he soon loses condition, and appears to be generally out of sorts. A dose of opening medicine—castor oil in the case of a young animal and aloes in that of an adult are serviceable in this direction—may be given as a preliminary measure, and some care should be taken to avoid foods that are likely to create flatulency or to upset the stomach of the affected horse. Unless the teeth are the primary cause of the trouble, soft foods and mashes should be avoided, as not only do they increase the attack of diarrhoea, but, being hastily swallowed, they are calculated to increase the indigestion. On the other hand, a food which requires to be masticated is swallowed slowly, and is not, therefore, so likely to bring inconvenience to the horse. It is better to limit the supply of water, especially in cold weather, not of course to the extent of keeping the horse in a thirsty condition, but in order to prevent any over gorging. Small quantities of water, given frequently, should therefore be the rule, and if the fluid can be chilled it will be all the better for the patient.



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How to Ascertain the Profitable and Unprofitable Cows in a Herd.

The Massachusetts station, (from Experiment Station Bulletin No 334) suggests the following plan by which the farmer can, with "a minimum outlay of time and money ascertain the profitable and unprofitable cows in his herd :"

WEIGHING THE MILK.

Begin when the cow is fresh and weigh her milk for three consecutive days in each month, preferably about the middle, and record the weight on previously prepared ruled paper. The sum of the amount produced for three days multiplied by 10 gives the amount produced for the month. The amount of milk produced in a portion of a month can be estimated by weighing the milk for one or two days and multiplying by the proper number. Continue the weighing for one year, and from year to year if you would know the whole truth. Preserve a yearly summary in permanent record book.

THE BALANCE.— Any spring balance or scale will do, but a balance with the scale graduated into pounds and tenths, and with a movable pointer so that when the pail is suspended the pointer may be made to indicate zero, is to be preferred.

— SAMPLING THE MILK. —

When to Sample.—Sample the milk of each cow in the second, fourth, and seventh month after calving ; any time during the month will be a fair index of the quality of the milk during the period. Thus if the milk tests 3,8, 4.2 and 4.8 per cent fat, the average would be 4.27 per cent for the entire period.

Utensils Needed in Sampling.—A pint jar for each cow, a small coffee cup or long-handled gill dipper for taking the sample, a box of bichromate of potash or corrosive sublimate tablets for preserving the sample.

How to Sample.— Powder fine with a knife one-half of a tablet and put in each jar. Milk the cow dry and pour the milk as carefully as possible from one pail to another three times in order to mix it. Do not allow any more frothing (air bubbles) than possible. Dip out a cupful of the milk at once and pour into the jar. Mix the milk with the preservative by a careful rotary motion. Do not shake or turn the jar upside down. Proceed in this manner for four consecutive milkings (two full days). Be sure to mix the milk by the rotary motion each time a sample is added to the jar and keep the jar tightly covered. The jar should be marked with the name and number of the cow.

— TESTING THE MILK. —

The samples may be tested by the owner of the cow if he has a Babcock machine, and acid, or it may be taken to the creamery.

Converting Butter Fat Into Butter.—Increase the pounds of butter fat by one-sixth thus : one-sixth of 245.5 pounds butter fat equals 40.9 added to 245.5 equals 286.4 pounds butter produced during the year.

The above method as described is of course not strictly accurate, but sufficiently so to enable the farmer to form a fair estimate of the productive capacity of his cows.

What is a Profitable cow ?

(a) For Market Milk.—In order to considered profitable, a cow should produce 6,000 pounds (2,800 quarts) of 3.5 per cent. milk yearly, without being forced.

(b) For Butter.— A cow ought to produce 300 pounds of butter yearly—if she does not do it, she is not helping you.

◆

Sparrows.

In view of the enormous damage done to crops by the sparrows and the general love and kindness with which, what the Americans even in staid official journals, have called the pesky little Britisher is regarded, the following paragraph from Cassells Illustrated Family Paper, of October, 1859, under the heading of Sparrows for Farmers will be read with some interest even, if it does provoke a little strong language. It reads :—

"Three hundred carefully selected sparrows from England have been lately sent to New Zealand. The food alone put on board cost £18. The necessity of small birds to keep down the grubs that devastate the crops has long been felt. The farmer is beset by myriads of caterpillars. Should the sparrows become acclimatised and multiply, the greatest benefit will be conferred on the Country." It would certainly be interesting to know, though impossible to estimate what that and other similar consignments have cost the Commonwealth and New Zealand, in the last sixty years, and unfortunately it is quite unlikely that it will ever be exterminated, but the existing numbers might be greatly reduced by united action on the part of producers. Poison offers practically the only hope of dealing successfully with the pest, it could be employed without great risk to other birds that are friends, not foes, to the man on the land. Experiments, conducted nearly 20 years ago by the Washington Bureau of Agriculture, proved conclusively that the sparrow could be readily and safely poisoned by the use of either arsenic or strychnine, the latter being preferable on many accounts. The method recommended was pub-

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lished in a bulletin, and has been very successful where followed. It it as follows :—Sparrows are baited regularly to some convenient feeding place, preferably an enclosed yard, where wild birds, pigeons and poultry are not likely to come, the bait used being cracked wheat or 'coarse corn meal ; or, if these do not prove effective, hemp seed, bird seed, or some other seed or grain which, by experiment, the sparrows are found to eat freely. The baiting process should be carried on for several days, until a considerable proportion of the sparrows of the neighbourhood are feeding regularly at the baiting place. Meanwhile some of the same kind of grain or seed with which they are baited should be poisoned, and after a few days some of this should be substituted for the usual bait at the time of regular feeding. Knowing about how much grain the birds have been eating each morning, and amount of poisoned grain fed can be regulated so that there will be very little waste, and yet every sparrow will be likely to get a fatal dose.

The directions for preparing the poisoned grain referred to in the foregoing paragraph are thus given in the Washington bulletin :—Obtain from the druggist a small amount of strychnine, being sure to get the crystals, so that they are readily soluble in water. Many failures result from the fact that druggists are (and should be) careful about selling poison, and may substitute some harmless drug for the bona-fide poison. Also, strychnine is furnished in an insoluble form as well as a soluble form. If the crystals of strychnine do not seem to dissolve readily in water, the addition of a few drops of vinegar will usually hasten the process. Ordinarily the crystals of strychnine are put up in little bottles holding ⅛oz. each, and this amount dissolved in two quarts of water is sufficient to poison four quarts of wheat or similar grain. The strychnine should be stirred into hot water and the whole allowed to stand for at least 48 hours, after which the grain should be spread out in a safe place and allowed to dry thoroughly. It may then be put into a jar or tight tin can, labelled "poison" and kept indefinitely, although it is well not to prepare any large amount of the poisoned grain at one time in order to lessen the possibility of accident. Grain thus poisoned does not look different from the ordinary grain used in baiting the sparrows, and will not excite suspicion. It is important, however, to make sure that the sparrows will eat this kind of food before any of it is poisoned, since they are very notional and erratic in their tastes and sometimes become so suspicious as to eat little or nothing in certain places.

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Making Lucerne Hay.

Experienced cultivators consider the best time to cut lucerne, whether it be intended for hay, or for immediate feeding as green forage to stock, is just as it comes out in flower. It then contains a very high percentage of nutriment, and is splendidly adapted for stock-feeding purposes. In cutting, whether the scythe or the mowing machine be used, care should be taken to get as close to the ground as possible ; in fact, "shaving" the surface with a view of getting the best possible results from subsequent cuttings, also prolonging the life of the plants. This not only tends to increase the density of the sward, but also prevents the formation of high "crowns," which if allowed to grow without being properly checked, son results in the lucerne becoming thin, assuming a more upright habit of growth, and giving space for weeds to make themselves objectionably prominent. If the weather is hot at the time of cutting, the lucerne intended for hay, and cut in the morning, should be gathered into windrows very shortly afterwards—certainly not later than the same afternoon. The handling with forks should be most carefully done The leaves in hot weather become brittle so quickly that if they are roughly tossed about they drop off, and this, as a matter of course, means inferior quality of hay. In very hot weather the making and stacking of lucerne hay must be done quickly, and with the least possible handling, for the reason given. From the foregoing, it will be understood that hard and fast rules cannot be applied to making lucerne hay. So much depends on the weather that close observation and common-sense are specially needed to furnish best results. Lucerne stacks, unless well built, do not run off rain nearly so well as oaten and wheaten hay stacks ; and for this reason particular care should be taken to "heart" them up in the middle as much as can possible be done with safety to the builder.—"Exchange."

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Harvesting Lucerne.

Its perennial nature and the reports of its wonderfully productive and nutritive qualities might naturally lead the farmen, without better acquaintance, to suppose that in lucerne he has perpetual pasturage ; that he will open the gate to his live stock in the spring, send for the butcher or buyer in autumn, and then winter in luxurious leisure. But he finds that the easiest is not always the most profitable way. Pasturing with any stock is an expensive and extravagant method of gathering a valuable crop from high-priced land. Where land is cheap and pasture is wild, stock are not expensive help in gathering a cheap crop ; but it is easily demonstrated that when land values are high and a crop value is in a like altitude, man with machinery can do the harvesting more economically than can a cow, a steer, or even a sheep.—Coburn's "The Book of Alfalfa (or Lucerne)."

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Protection of Cows From Flies.

Flies are frequently a source of great annoyance to cattle, including milking cows, and the opinion is generally held that in such cases the worry entailed on the animals results in a loss of weight, or—in the case of cows—in the diminution of the milk yield. In the United States and Canada during the hot seasons various contrivances have been adopted with the object of protecting the animals from attack by flies, and the best means of doing this is to wash over the coats of the cattle with a mixture containing some material which is repellant to the worrying insects.

At the Kansas Experiment Station several mixtures have been tried for this purpose, the best results being given by a preparation consisting of $1\frac{1}{2}$ lb. of resin, 2 cakes of laundry soap, $\frac{1}{2}$ pint of fish oil, and enough water to make the whole up to 3 gallons. This mixture was either applied with a brush or sprayed over the animal. In the latter case $\frac{1}{2}$ pint of kerosine oil may be added with the other ingredients. The cost of the mixture is not more than 7c. or 8c. per gallon, and $\frac{1}{2}$ pint is considered enough for a single application to each cow. It was found that at first two or three applications per week were necessary, but later on treatment need not be given so often, since the tips of hair become coated with resin.

At the Missouri Experiment Station a patent preparation for protecting cows from the worrying attacks of flies was tried for some time. It is reported that the chief observed result was that the cows stood more quietly during milking.

Observations made at the Virginian Experiment Station indicated that during the season when flies were most prevalent the milk yields of the cows fell off by as much as from 25 to 50 per cent. Various mixtures for repelling the flies were tried without avail, but success was obtained when an emulsion of kerosine oil was employed. The emulsion consisted of $\frac{1}{2}$ lb. yellow soap, 1 gall. soft water, and 2 gall. kerosine oil, to which was finally added a second gallon of water. This formed the stock solution, which was diluted just before using by adding 1 part to 5 parts of water. The mixture was applied to the animals daily, by means of a spray pump. It was found that 15 gall. of the diluted solution was sufficient for one treatment of 100 cattle.—Agricultural News.

◆

On the first suspicion of mange in a horse isolate him, and do not use any of the brushes on others. Disinfect the stables at once.

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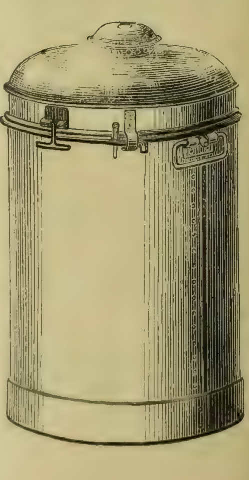

Dual-Purpose Cattle.

There is no doubt a strong element of truth in the contention that if it is desired to attain pre-eminence in the production of either beef or milk there must be a concentration of effort upon the one object aimed at. If the quickest and most liberal return in beef is the object desired, it would unquestionably be expedient to select the stock and manage the affairs of the herd exclusively with this object in view, and the same singleness of purpose should be observed if it should be deemed advisable to subordinate everything else to milk production. This much is not denied by any experienced stockowner. There is a distinct difference, however, between the realization of an object and the advisability of pursuing that object. There may be certain districts in which it would be a profitable proceeding to give primary attention to the one purpose, usually to milk production in the vicinity of populous centres, and to grazing properties in more remote localities. In the main, however, there are suitable means of realizing to advantage both beef and milk, and therefore it is usually expedient to keep the requirements of both markets in view. As has been indicated, this may mean moderation in the production of both articles; but only in exceptional cases will the extra measure of success in the one suffice to atone for the sacrifices entailed in the other. Admitting that in attaining excessive response in either milk or beef there must be special concentration, it is evident that there must be a very marked increase in that one produce to make good the loss entailed in the other. A little extra return in milk or in beef may very easily prove unduly flattering, and what farmers have to consider—not merely in a casual, indefinite way, but by sytematic investigation—is whether the extra success achieved in that one object does not entail a disproportionate loss in other directions. It may require a somewhat elaborate and minute inquiry to settle so intricate a point, yet some concrete evidence respecting the question is necessary before an emphatic opinion can be given concerning it. We are inclined to think that there is a general and natural tendency to magnify the importance of the extra gain in milk or in meat obtained by concentration of effort and attention in the breeding and feeding of cattle. Nothing is easier than to exaggerate the value of a few extra gallons of milk in the year, or to minimise the consequent loss in beef development, or vice versa.

There is another phase of the question which also tells in favour of the dual-purpose animal, and that is that by equalizing the claims of meat and milk in the management of the herd the owner is catering for two markets instead of one, and in this way reduces the risk of encountering an unappreciative trade. It is generally prudent to avoid the policy of putting all the eggs in one basket, and this wise remark applies as effectually to the meat and milk markets as any other. The meat market has hitherto been much more severely affected by foreign competition than that for new milk, yet it is still worthy of attention, and must ever continue to be so.—The Field.

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Corns On Horses' Feet.

A corn, be it remembered, is not a tumour or a growth; it is merely a bruise of the sensitive foot under the horn of the sole. It shows itself by staining the horn red, just as a bruise of the human body shows a staining of the skin above it. To "cut out a corn" with the idea of removing it is simply an ignorant proceeding.

If a corn be slight, all that is necessary is to take off the pressure of the shoe, and this is assisted by removing a thin slice or two of horn at the part. When the injury is very great, matter may be formed under the horn, and, of course, must be let out by removal of the horn over it. Provided there is no reason to believe that matter has formed, a corn—i.e., the bruised and discoloured horn—should not be dug out in the ruthless manner so commonly adopted. Cutting away all the horn of the sole at the heel leaves the wall without any support. When the shoe rests upon the wall it is unable to sustain the weight without yielding, and thus an additional cause of irritation and soreness is manufactured. The excessive paring of corns is the chief reason of the difficulty of getting permanently rid of them.

The simplest device for taking all pressure off a corn is to cut off an inch and a half of the inner heel of the shoe. With the three-quarter shoe a horse will soon go sound, and his foot will then resume its healthy state. The saying, "once a corn, always a corn" is not true; but it is true that a bruised heel is tender and liable to bruise again, from very slight unevenness of pressure, for at least three months. All that is necessary is care in fitting, and abstention from removal of too much horn at the part. Of course, when the degree of lameness is such as to suggest that matter is formed, the horn must be cut away so as to afford an exit for it; but the majority of corns are detected long before the stage of suppuration has resulted from a bruise.—From Hunting's "Art of Horseshoeing."

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Milking A Goat.

Milking a goat is not a difficult operation by any means, although it is much easier in the case of some animals than of others. It is easiest with those goats that have nicely pointed teats of a size readily grasped by the hand.

There is a certain knack in the process which is soon gained after a few days' practice. It consists in causing pressure on the teat by each of the fingers alternately from the first to the little, but in such rapid succession that the pressure is almost simultaneous. At the same time the hand draws down the teat, pushing the latter again up towards the udder as the stream is reduced, in order to encourage a fresh flow. Both hands should be used, each working alternately.

The great point is to draw off all the milk contained in the udder at each "meal," as it is termed, because if any is left behind, the yield tends to fall off, and a less quantity is drawn on the following occasion. This being repeated often, the animal soon goes dry.

To ensure a thorough extraction of all the milk in the udder, the latter should, when the flow ceases, be worked about in the hand, and the teat pushed rather violently up into it, in imitation of the action of the head of the kid, when it does not find enough milk present. This often results in adding another quarter pint, or even half-pint, to the pail.—"Farm Life."

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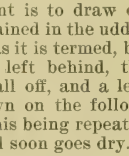
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Dodder.

It is frequently thought by farmers and others that serious infestations of dodder are uncommon and that the whole question as to the powers of this parasite for ill may, on the whole, be neglected. But is this so ? It is quite possible even probable, that in most parts of this country the first proposition is true ; but that farmers can therefore neglect the subject with impunity I cannot for one moment agree. In the pages of The Field attention has many times been directed to the harm wrought by dodder in the clower and lucerne field, and to the latent possibility of the pest working havoc over large areas. Especially, perhaps, would the result of a widespread infestation of dodder prove disastrous where the clover or other similar crop happened to be intended for seed. Although it germinates in the soil, dodder eventually subsists entirely on its host plant (the plant it attacks), which, in absorbing the juices, it reduces to a state of exhaustion. I would especially draw the attention of farmers to the damage done by dodder, because it is perhaps less easily dealt with than most other weeds, few of which are parasitic. The subject is well worthy of the attention of all farmers, especially those largely cultivating leguminous crops, such as clovers, lucerne, vetches, etc., for dodder flourishes on many species of plants.

In the September issue of the Journal of the Board of Agriculture, a long and beautifully-illustrated article deals very fully with this subject, and a few of the more important points discussed should prove valuable to agriculturists. After drawing attention to the fact that 11 per cent. of the clover seed samples examined in 1905 by the botanist to the Royal Agricultural Society were condemned owing to the presence of dodder, it is remarked that some eighty species of dodder are known to science. Of these, however, only about half-a-dozen are of much importance to British agriculture, the chief species being Cuscuta trifolii, an annual plant belonging to the order Convolvulaceae. It chiefly attacks red clover and lucerne, and is aptly termed "clover dodder." Germinating in the soil, the seed sends out a thread-like coil, which unwinds gradually, and on reaching a hostplant attaches itself firmly by means of suckers. These thread-like stems extend to surrounding plants, and the patch rapidly spreads, the dodder leaving its hold of the soil, and living wholly on the clover, or other host-plant, from which it extracts the juices. "The harm done is best explained by stating that dodder possesses no chloroplasts, and is unable to take up carbon dioxide from the air like ordinary green plants; it depends entirely for its food material on the ready-made products which it absorbs from its host plant, which therefore becomes exhausted, and dies." This species of dodder produces clusters of small white bell-shaped flowers. Although dodder is an unusual and quite leafless plant, growing from seed, it appears that it may be spread also not only by means of small fragments of the stems, but by little tubercles formed in winter (according to M. Marre). C. europae (great dodder), C. gronovii (large American dodder), C. epilinum (flax dodder), and others are also sufficiently dangerous to warrant especial care in the selection of seed clover, &c.

All species of dodder are parasitic on plants of a higher order, and resemble one other very closely as regards life history, and manner of growth. It is not believed that C. gronovii ripens its seeds in this country, but the seeds germinate if sown, and produce dodder plants capable of killing their host-plants. The seeds are larger than those of other species, and being about the same size as lucerne seeds are difficult to separate. The seeds of most species of dodder are usually much smaller than the seed of red clover, and they are roundish and angled. Those of C. trifolii are dull in appearance about 1 mm. in diameter, and grey, brown, olive-brown, or yellowish-brown in colour. Among plants attacked by the various species of dodder may be mentioned clover, lucerne (in general these two are the most important), vetches, lupines, flax, potatoes, beet, carrots, fennel, aniseed, furze thyme, ling, the vine, hemp, acacia, poplar, chicory, and other plants. In Italy, France, Germany, and the United States dodder appears to be the cause of very much loss to farmers; in South Africa it is spreading; while it is also said to occur more or less in Russia and Chili. Generally speaking clover seeds are imported into this country from nearly all parts of the world, especially Germany, France, Australia, Chili, Canada, and the United States. With the exception of the two last-named, the seed from nearly all these countries contains more or less dodder, but in that from Canada and the United States it is hardly known. The clover seed exported during the last few years from New Zealand has also been of high quality, and is generally free from dodder. Lucerne is chiefly imported from France and the United States, but hardly ever contains dodder."

As to method of prevention and remedy, the article recommends, among other things, the following: No seed should contain a trace of dodder; but, dealing with reliable firms, farmers should obtain a guarantee of freedom from dodder; the purchaser should sift it, using a sieve of twenty meshes to the inch; seeds may be submitted to an expert for examination and approval; infested plants may be dug up and burnt in situ by covering the patch with long chaff, and firing with paraffin; an infested field should not be allowed to carry a leguminous crop for several years. It is suggested that the infested spots be surrounded by a small trench (persumably to prevent the dodder spreading); dodder should not be torn out with a rake, as this only serves to spread the evil; infested crops should not be fed to stock, as the seeds pass through the system unharmed; and, finally, in cases of extensive infestation, it is perhaps better to plough the whole crop under before the dodder ripens its seeds.—"Elders Review."

◆

A Good Cow.

A good cow has a good udder, and a good udder is large and well balanced—that is, hangs level and with the fore part as low as the hinder part. I admit that there are good milking cows that do not conform to this rule. In most cases the udder of the ordinary cow is much fuller and lower behind than in front, and the greater part of the milk comes from the two back quarters. Experiments have been made from time to time in order to ascertain what connection there is between the yield of milk and the shape of the udder, and it has been proved that the heaviest milkers have a well-balanced udder, and give as much milk from the front teats as the hind ones. It is, therefore, advisable to give this attention in breeding and in selecting cows for purchase. No matter how good the bull may be, the cow with a bad-shaped udder is pretty sure to transmit the fault to her heifer calves. It is a well-known fact that by careful breeding and selection any defect in an animal can be removed, and an improvement gradually brought about and in view of the importance of a good milk vessel it is well worth the serious attention of breeders to develop that part of the cow in the manner desired. In purchasing cows the dairyman, in the absence of any reliable information as to their milking properties, can be guided to a large extent by the points and general appearance, and it appears to be necessary to pay particular attention to the size and shape of the udder, especially in reference to the way in which it hangs.—"Agricola," in the Otago Witness.

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Hoofs.

Even to this day many blacksmiths possess the idea that the horse's hoof is "hoof horn" right to the core. It is doubtless for this reason, or rather by reason of the lack of understanding of the anatomy of the structures underlying the horny wall of the hoof, that so much cutting, rasping, burning, nailing, and other abuse of the structure is carried on. The hoof is not all horn, and the sooner it is generally understood that within the thin-walled outer box of horn there are wonderfully sensitive blood and nerve-endowed tissues and working parts bearing an intimate adaptation one with the other, the better will it be for the horse.

In the normally-developed foot of the unshod colt the horny box or boot fits the inner foot perfectly. There is no pinching or squeezing anywhere, and the hoof gives perfect ground bearing and support to the leg, while serving to prevent undue concussion from contact with the ground. The large, elastic, insensitive outer frog, underlaid by a fatty frog, serving as a cushion to prevent ill effects from concussion, bears upon the ground. The heels are wide, the bars strong and full, the sole somewhat concave, and the walls smooth, free from grooves, ridges, cracks, wrinkles, and brittleness, and showing exterior varnish and evidence of healthy oiliness of the horn tissues.

Many things in connection with shoeing may cause lameness. They may be enumerated as follows:—Rasping away the outer varnish layer of the hoof, cutting out the old horn of the sole and so allowing the imperfectly-formed new horn to become exposed, cutting the frog, cutting out the bars, opening the heels by cutting a deep notch on each side of the frog, keeping red-hot shoes too long in contact with the denuded sole, inattention to proper resetting of the shoes, keeping the horse too much confined upon a dry board floor, depriving the animal of the necessary luxury of a run at pasture, improper feeding and management, and, lastly, the frequent application of strong, drying, hoof-dressing substances.

Treatment should consist in as early as possible re-establishing natural conditions in the environment of the horse. Everything possible should be done to improve the general health of the horse, and he should be fed for the perfect repair of his tissues. That means plenty of oats and bran. Then he should have an opportunity to go on pasture, but where this cannot be done his hoofs should be soaked in cold water frequently, and on removal should be smeared with any simple, non-stimulating or drying hoof dressing.—H.R., Live Stock Journal.

◆

Recipe For Whitewash.

A first-class whitewash is made by dissolving 2 lb. of ordinary glue in 7 pints of water and when all is dissolved, adding 6 oz. of bichromate of potassium, dissolved in a pint of hot water. Stir the mixture up well, and then add sufficient whiting to make it up to the usual consistency, and apply with a brush in the ordinary manner as quickly as possible. This dries in a very short time, and by the action of light becomes converted into a perfectly insoluble waterproof substance which does not wash off even with hot water, and at the same time does not give rise to mould growth, as whitewash made up with size often does. It may be coloured to any desirable shade by the use of a trace of any aniline dye or powdered colouring, while by the addition of a small proportion of calcium sulphite, its antiseptic power is much increased.—Exchange.

◆

Developing Heifers.

Good parentage, which means parents well descended from decided milking stock, is very essential in giving a heifer the right start in life. But that is the beginning. The subsequent development of the heifer is in the hands of the owner, and this development depends very greatly, if not wholly, on the way she is cared for and fed from calfhood up. The inheritance the heifer derives from father and mother is a very feeble force to start with. It must be nourished and kept in a condition favourable to the development of maturity and the milk producing organs. This does not mean a fat or highly fleshy condition, for that has a tendency to produce atrophy of the organs to the extent sometimes of producing barrenness. But it does mean keeping the heifer in a highly thrifty, growing condition, so that all of the genital organs shall be abundantly nourished.

Quite frequently heifers in their first and even second and third milking periods do not come to their fully-developed milking capacity. We have a cow in our own herd at the present time that well illustrates this principle. She is seven years old and has had five calves. She is a large, strong cow, and has been generously fed and cared for from a calf. During her

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first, second, and third periods of milk-giving she made on an average 290 lb. of butter-fat a year. She has always seemed somewhat deficient in udder capacity, but at her last calving she developed one of the finest udders we have ever seen, and she is giving a large flow of milk. We have had several cows which have followed the same line of later development, in some instances nearly doubling their milk yield in the fourth, fifth, and sixth periods to what it was in the first, second, and third.

This we think rarely happens if the heifer is not generously cared for in calfhood and in her subsequent history as a cow.

If farmers would learn to treat their heifers and cows as liberally in proportion as they do their horses or hogs there would be more good cows in the country.—Hoard's Dairyman.

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An Important Point For Dairyman.

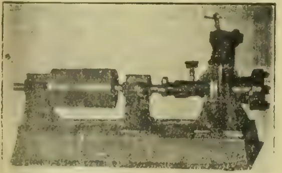
In my opinion sufficient attention is not given by dairymen to the "cleaning" of their cows after calving, and the retention of portions of the placenta, or after-birth, is a frequent cause of sterility and abortion in these animals. Naturally, the "after-birth" comes away cleanly of its own accord. Occasionally it is retained for over 12 hours, and in these latter cases it is necessary to adopt treatment. Often the administration of a drench containing the following brings about the desired result:- One oz. ammonia carbonate, 12 oz. sulphate of magnesia (Epsom salts), 2 oz. common table salt, and 1 oz. of powdered ginger. Dissolve these in two pints of warm water or ale and add a cupful of treacle. When thoroughly mixed the drench is given by the mouth with usual care. If the "after-birth" remains intact after the drench has operated, it is necessary to render assistance by passing the hand and arm, lubricated with carbolized vaseline, into the womb, and exercising gradual traction. If the whole of the membranes have not been completely removed, and the discharge become foetid in character, the womb should be irrigated in a manner similar to that practised in case of contagious abortion. To do this all that is required is about one and a half yards of rubber tubing, 1 in. in diameter, and fairly stout; a glass funnel (bottle with bottom knocked out will answer), and a supply of corrosive sublimate in tabloid form. The funnel is attached to one end of the tubing, and the other end, after being lubricated, is gently passed by means of the hand into the mouth of the womb. The corrosive sublimate is dissolved in water in the proportion of one part to 3,000 parts, and then poured into the funnel, which is held higher than the animal, so that the fluid passess into the womb. When the womb has been irrigated with a sufficient quantity, usually about a quart, the animal ejects the fluid, and frequently portions of the retained membranes will come away at the same time. The treatment should be repeated daily until the discharge assumes its natural appearance or ceases. The buttocks and tail should also be washed down with the corrosive sublimate solution, which is a reliable germicide.—"N.S.W. Agricultural Gazette."

◆

Lime In The Dairy.

In all Danish creameries barrels containing lime water occupy a prominent position. The creameries, which years ago practised the steaming of all churns and other dairy utensils regularly in order to keep them sweet and were now simply scrub them in hot water, and while the surface is still warm, apply with a brush a generous coating of thick lime-wash, which is partly absorbed by the pores of the wood, purifying and making it bright and firm. The surplus lime is afterwards washed off; in fact, it appears that lime takes the place of washing soda, being much superior for creamery purposes, and a great deal cheaper as well. Lime removes grease and sour smells from floors and utensils, makes tinware brighter, and the grain of wood firm, bright and loose.

The by-laws of some creamery associations strongly recommend suppliers to use lime for cleaning their milk vessels, as well as for whitewashing stables, milk-houses, &c. The formula for preparing lime water in which utensils may be immersed is thus given:—"The solubility of lime at ordinary temperature is one part in 700 parts of water. Such a solution would be termed saturated lime water. Translated into pounds and gallons, this means that 1 lb. of lime is sufficient to saturate 70 gallons of water. However, owing to impurities in commercial lime, it is well to use more than is called for in this statment. If good, freshly-burnt quicklime can be obtained, 2 or 3 lb. to 5 gall. (50 lb.) would be thoroughly saturated. The method of preparation is simply to slake the lime with a small quantity of water, and then stir the milk of lime so formed into 5 gall. of water.



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Uplifting the Dairy Herd.

[By Hipi Kuia in "The New Zealand Stock and Station Journal."]

As one of the many writers to journals connected with the pastoral and agricultural interests of the Dominion, who for years have been trying to arouse those on the land to improve the methods of work and also of live stock, it is encouraging to see that of late there is what may be termed a wave of improvement generally, and more especially towards uplifting the dairy herd. There is no need to say anything as to the possibilities of improvement, as they are well known, and now recognized by most men connected with the industry, which is now one of the mainstays of the country. In stockbreeding—it matters not whether sheep, cattle, horses, pigs, or fowls—"there is always room on top." There is no finality; at least, so far, never has an animal been bred but that a better one, sooner or later, has taken its place. Another maxim worthy of reiterating is:—That there is no such thing as standing still, as flock or herd must be either advancing or deteriorating. When starting or trying to improve a dairy herd the same system applies as to breeding for beef, mutton, or wool. Some have the idea that it is a simple matter to start or improve a herd or stud, should the owner have unlimited command of capital. Such is far from being the case, as in my experience of upwards of 40 years in Australia and New Zealand, I can count on my fingers the studs or flocks that have had permanent prominence, and even then money has had little to do with the high character gained. In every case that I can bring to mind it has been the permanency of the studmaster and the wealthy owner's recognition of his ability. In the majority of cases where flocks or herds have gained prominence they have been raised to that position almost entirely by the owner having that intuitive gift of selecting without which it is seldom a breeder is successful. Although first class studmasters, having that thorough knowledge of animal character that enables them to mate the sexes to the best advantage, are rare, still for breeding ordinary stock any one who has his heart in the work and loves it will make a success.

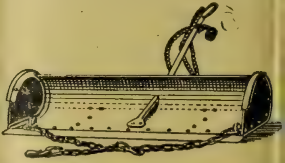
With respect to dairying, unfortunately few men as yet enter the business because they like it and intend to spend their lives at such work; the object of most being to make money quickly, so as to enable them to enter into something else that is not so engrossing. This is the chief reason why there has been so little improvement in our herds in the past. If we read the signs of the times aright we are now entering upon a new era. High prices for land are far from being a blessing, still, there is no doubt that in the case of the dairy industry the abnormal price now ruling for land is one of the main factors tending to the improvement in the milk yield per cow. When dairy land could be purchased at £4 or £5 per acre the man with a herd that returned 180 lb. or 200 lb. of butter-fat in the season might make a decent living; now that same land is worth £20 per acre he feels compelled to make a change. The land will not carry a large number of cows, and the expenses cannot be much cut down; in fact they have increased, owing to the scarcity of labour; therefore the only thing to be done is to improve the milk-production per cow. So that dear land is really a blessing in disguise, like many other things that affect the farmer.

When tendering advice to farmers generally in the columns of agricultural journals, as an old farmer I perfectly understand that it is only a very small section that will take the trouble to read, let alone consider, the position put before them. There are those that think they know their business better than any one else. To such we can only say, "Then why be content with such an inferior herd? Why not act on your knowledge and add 200 lb. or 300 lb. of butter-fat to your season's returns?" It is the man that admits he has always something to learn that succeeds in every calling.

Just a word to the young man starting in life. Personally I thought 40 years ago that there was little any one could teach me; while to-day there is much I would like to know in connection with stockbreeding, after nearly half a century's experience. Therefore, my advice is to be always looking for information, as should you live to 100 there would still be something you did not know, even in what some consider the simple matter of breeding stock. To those readers of this article who are looking for information as how best to improve their dairy herd a few hints may be acceptable.

The man that intends starting a herd should endeavour to secure as good cows as it is possible to buy. Not that it is always advisable to go into fancy prices. Should there be a clearing sale of a decent herd that is the best opportunity, and if the herd has been built up from within itself so much the better. Avoid buying one cow here and another there; better give a little extra, or if the purse will not stand that, make a start with a smaller number, and by all means reserve sufficient to purchase a pure-bred bull of whatever breed is considered the best for the locality.

With respect to this important question of breed, look around and notice which is most appreciated, and follow the example of the older settlers. It is not wise for a stranger to a district to start right off and introduce a breed that has never been tried: better follow than lead until cer-



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tain of your bearings. No description in writing can give such a good idea of the form of the milk cow as inspecting such as have an undeniable record. Although there are numerous types of milkers, the general conformation is nearly about the same. In days gone by it was only by appearance that cows were valued. Now those that have good cows to dispose of are prepared with a record of their ability as milk-producers, and the time is not far distant when it will become a necessity to give a record, the same as a pedigree, when disposing of cows for the dairy.

In the building up of our herds lies the greatest hope of the advancement of the dairying industry in the Dominion, there being no reason why the output of dairy produce should not be doubled without adding anything to the number of cows in the course of the next 10 years. This may seem an extravagant proporsal, but when we consider that the general average of butter-fat is only about 180 lb. per cow per season, instead of raising the standard to only 400 lb., there is no reason why it should not be 600 lb., should every one put his shoulder to the wheel, and by testing and weighing the milk, weed out all cows that do not come up to the fixed standard.

Some even of our foremost dairy men pooh-pooh the idea of testing and weighing, thinking they can tell by looking at the bucket what a cow is giving them. A friend, well known in dairying circles, who has been at the game for 30 years, and whose herd was and is considered the best in the district, a year or two back having decided to reduce his herd by one-half, systematically weighed and tested each cow's milk throughout the season, to enable him to better judge which to dispose of. He told me that it was an eyeopener, showing how little he knew what individual cows were returning him. Some of his fancy cows fell far below others he thought of little value. Now, when such a recognized authority, who attends to the milking himself, was deceived, we may take it that the only way to raise the status of the dairy herd is by testing and weighing the milk.

Previous to coming to this knowledge it was accepted that only a limited number were good judges of form or character of their cows, so that it was difficult to see how the ignorant could be helped to eliminate the unproductive. Now that it has been shown that testing and weighing, which every one can do, is absolutely the only true test of the cow's value, it should be a simple matter to raise the dairy output. Still, there is room for individual judgment in selecting the bull and the heifers that are to take their place in the herd.

The first thing to consider is constitution, and again constitution in the ancestors of the bull, if that can be had. Of late years studmasters have in some cases been sacrificing constitution in order to gain some desired fad or fashionable point of excellence—perhaps there has been too much of this in dairy cattle as some other breeds. However, the sire must have a strong, robust constitution, not necessarily coarse, rather the reverse; not more masculine than just to show clearly by appearance that he is a male. Colour is also a good guide as to the character of the bull; any markings not in keeping with the recognized colours of the breed it is always best to avoid. At times some of the oldest breeds produce what are termed sports, or atavism—the recurrence of the type of some remote ancestor. Sometimes throw backs may get good stock, but the risk is so great that they ruin the herd, so that the ordinary breeder had better leave them alone.

The bull, besides having pedigree, constitution, form, and colour for dairy purposes, must come from a milking strain, more especially on the dam's side. Authorities also insist on the rudimentaries attached to the testicles being well developed, to ensure the heifers having shapely udders and well-firmed teats.

In selecting the heifers, keep those from the best cows, so long as they have strong constitutions and are shapely. The testing and weighing of their milk will prove whether they are worth keeping a second year.

The Color Effects of Feed on Milk.

An experiment was carried out at Wye Agricultural College to ascertain—(1) How long a period it takes before a change of colour becomes marked? (2) What is the minimum quantity of carrots required to alter the tint? (3) Will a mixture of carrots and mangels answer the same purpose? (4) What effects have carrots on the churning character of the cream, the quality of the butter, and the percentage of fat in the milk?

For the experiment four cows of the Lincoln Red breed were picked out, the animals having calved down a few months previously.

Two of the animals were fed on 28 lb. of carrots, and their ordinary allowance of cake, meal, and hay. Two others were fed in a similar way, mangels being substituted for carrots. The records were taken in February and March, and the feeding reversed, i. e., carrots being substituted for mangels after the first month of the trial.

A brief summary of the result is as follows:—

First week—Some diffference apparent.

Second week— Difference more marked, less time occupied n churning, and better grain and flavour.

Third week—A very good high coloured butter, considering the time of year.

On reversing the order of feeding it was noticed that the colour was maintained in a diminishing degree over two or possibly three weeks. The experiment did not last long enough to finally answer the question as to how few carrots will give the required tint, but it may be said that half mangels and half carrots gave a more saleable quality of butter than those getting a full ration of mangels.

The change of food had the effect of slightly lowering the butter fat in the milk of one cow, and practically made no difference in the others.

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Manuring Experiments.

Which is the most profitable phosphatic manure? To test this question, dressings of equal money value were given of superphosphate, basic slag, bone meal, ground mineral phosphate were tried at the Aberdeen and North of Scotland College of Agriculture with the result that:—

Superphosphate produced a net profit of £2 10/ per acre.

Basic slag produced a net profit of £2 0/8 per acre.

Bone meal produced a net profit of £1 12/ per acre.

Ground mineral phosphate produced a net profit of £1 3/3 per acre.

Two Proprietary manures were also tried, and yielded:—

Improved superphosphate, a profit of £1 12/9.

Basic superphosphate, a profit of £1 18/6.

The above results have reference to applications of artificials alone, but as turnips are grown more often with dung in conjunction with artificials, the experiment to test the most profitable combination of dung and artificials has a more practical interest. The best result was obtained from a dressing of 10 tons dung, supplemented by—

$\frac{1}{2}$ cwt. sulphate of ammonia,
3 cwt. superphosphate,
42 lb. sulphate of potash,

which produced an increase over the 10 tons dung alone of 5 tons 3 cwt. per acre. It thus appears that a small quantity of nitrogen and potash will repeay the cost, and add to the usefulness of the phosphate even when dung is used.

The general conclusions derived from the experiment are:—

1. That while phosphates are most necessary for the turnip crop, potash is often deficient, and it is worth while for each farmer to experiment for himself in order to discover the wants of his soil.

2. That bone meal and ground mineral phosphate are much inferior to superphosphate and slag as turnip growers.

3. That superphosphate is a little more effective than slag, but a mixture of both is generally good.

4. That improved superphosphate and basic superphosphate, in comparison with superphosphate and slag, are not worth the extra price charged.

5. That a small complete dressing of artificial manures, amounting to 3 or 4 cwt. per acre, will give a profitable return, along with 10 tons of dung.

6. That more than 10 tons of dung do not give a proportionate increase of crop.

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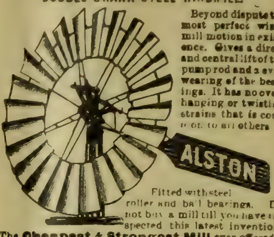

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CART or DRAY HARNESS.—Saddles 22/6, 25/ and 27/6; Breeching same price, 22/6, 25/ and 27/6; Shaft Belly Bands, 6/6, 7/6; Leading Belly-Bands, 3/, 3/6; Iron-cased Hames, 5/6, 6/6, 7/6, 8/6. (Really Good); Hame Straps 9/ per doz., or 10d. each; Cart Winkers, 8/6, 9/6; Patent, 10/6; Queensland Pattern, 11/6, Plough Backbands, 5/6, 6/6, Spiders, 7/6, 8/6; 9/6; Best Chains, 5d. 6d. lb.

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Dry v. Wet Milking.

Many people claim that the dry system of milking is far more cleanly than the wet, but other experienced persons strongly combat that view. These assert that the milk can be contaminated in the pail with dry scales and dirt, when the dry method is adopted, just as it can from milk contaminated by contact with the hands and the outside of the teats. There are two systems in use for milking: one is called squeezing and the other tugging or stripping. When the tugging or stripping plan is followed there is no question that a little lubrication, by means of milk, lessens the friction, and a similar result would follow in a lesser degree when the squeezing plan is followed by the milker. The advocates of wet milking very reasonably urge that it is more in accordance with the natural process as carried on by the calf than is the dry method, and they also urge that the teat and udders are more likely to contract troubles through the cows lying in wet or dirty quarters than from wet milking. A calf will suck its dam many times during the day, and the teats are naturally left wet. Under such circumstances it seems that the advocates of wet-milking have the strongest arguments in favour of their theory. Yet, for all that, the wetting of the hands with the milk does not appear a clean and pleasing process, but it may be made more or less so according to the ideas of the persons who practise it.

◆

The Kicking-Out Habit.

Some cows are to be met with that have the awkward habit of kicking out at anyone passing behind them when stalled. The frequent cause of this is the having been struck from behind previously, surly attendants sometimes striking cows upon the leg with the fork whilst cleaning out.

Cure is not easy, but, to avoid being kicked, whilst at the same time to pretend not to notice the kicking, tends to make the cow think she is wasting effort. Or, if she kicks very determinedly, stuff a bag tightly with straw and suspend it with a rope so that it well clears the ground and hangs about a foot off the rear of the cow. When the cow kicks, the harder she does so, the more violently will the bag come at her heels again, and the usual result is that the animal is so cowed in the end that she is afraid to start kicking again.

A cow that kicks whilst being milked may drop it if carefully coaxed and humored for a time whilst milking is on. If this does not answer, tie her legs in the usual manner, milking her without being tied occasionally, and she may drop the kicking if she finds that it leads to restraint.

Dairying is profitable if you do the right kind of dairying.

Sprouting Potatoes for Planting.

Reply to "Murphy."—The best way of sprouting Potatoes ready for planting is to place them, crown upwards, in small trays or boxes. The best eyes are on the crown, and the central one in this way will develop a sturdy green shoot half an inch or so long. When in that condition it is ready for planting. Potatoes are seldom given room enough to do their best. To prove this we have only to note the crop produced by outside rows in any given plot. The best manures for Potatoes are those containing a preponderance of phosphates and potash. If the land is poor and nitrogenous manures are used to finish off the crop, scatter nitrate of soda alongside the rows, just previous to earthing up, at the rate of 2lb. per square rod. Two applications of half the quantity will be better. The hoe should be used freely. The rows of strong-growing Potatoes should be three feet apart, and the sets in the rows 16 inches from each other. The depth of covering should be from four inches to six inches, according to the nature of the soil and the season.

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Not a Kick for a Kick.

A passage in the Scriptures says, "An eye for an eye, and a tooth for a tooth;" but was never meant as I think some cow-boys appear to take it. I have heard them excliam (when a cow has kicked) "I'll show you now that I can kick." If a pat on the ribs and a caress were exchanged for a kick, a cow would soon think that she was unfair, and resort to a quieter attitude. Kindness to the cows on a dairy farm is equally as good a milk producer as maize, lucerne or mangels. Milkers! have this motto "Good for Evil," and don't forget to give your cows a lump of rock salt to take the rough edges off their tongues. —Cowboy.—

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Farm Hints.

Salt is a preventive of worm infection. It is nature's vermifuge, and should be laid about so cows can get at it with ease.

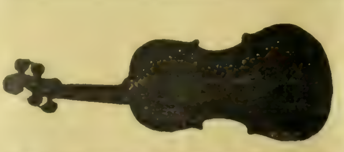
The waste of nitrogen from the soil may be made up, in some degree, by the planting and ploughing in of leguminous crops.

Pigs like plenty of good water and grass. The man who keeps his pigs growing all the time till he markets them is making money.

The real test of the good cow is her performance after the first three months in milk.

A good dairy cow, if properly fed while dry, will lay on a considerable amount of fat, and after freshening she will not only use the food given her for milk production but will draw on her own body fat to increase the milk flow, and no matter if you feed her practically all she will eat from the time she drops her calf, there will be a gradual falling of the flesh for six or seven months after she has calved.

Attention is directed to the advertisement of Messrs. Ward Bros., of 7 Arcade, with reference to the "A.N.A. Sewing Machine." This useful domestic machine has become very popular in the other States, and more especially in Victoria. Since the opening of the firm's branch in South Australia big business has also been done, the many good points of the machine readily appealing to our lady friends. Inspection is cordially invited.



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Compensating Piston Brass Band Instruments. "Correll" Cornets from £3 1s. Boosey Cornets from £5 10s.

Placing the Homestead.

In fixing upon the site of a new farm house and buildings there are some things which should be borne in mind, and which are often overlooked.

They should be placed on ground high enough to make them safe, not only from actual flood, but from dampness. They should not be crowded so closely together that one would endanger another in case of fire.

The stables should be near enough to the house to be convenient when animals require attention during the night, and also to prevent loss of time when passing to and from the house for meals.

The position of the water supply should be considered. Water is required all day and all the year round, and the carriage of water from a distant well or spring means much to the wife, unless proper provision is made and a full supply is hauled to the house door. Then the supply for the stock must be borne in mind. It may not mean much to the horse and cows which are driven to water, but it means time for the driver also, and all time should be considered.

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TO STOCK OWNERS.

This well-known COLONIAL OFFICE is now issuing.
LIVE STOCK POLICIES.
with most lenient conditions, specially prepared to meet local requirements covering
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Claims paid exceed £7,500,000
Departments — FIRE, MARINE, ACCIDENT, EMPLOYERS' INDEMNITY, PLATEGLASS, FIDELITY GUARANTEE, ADMINISTRATION BONDS, BURGLARY, LIVE STOCK

Lastly, in placing the homestead its convenience to the road should be considered. It should be removed far enough to escape the dust which so often sweeps along a main road, but to be within reasonable distance of it is a nonvenience, especially on dark nights.

A well-placed homestead adds to the actual money value of a farm, and though you may have no idea of selling, you will not object to the value of your property being as high as possible. —"Australian Agriculturist."

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Parasitic Diseases in Sheep.

Professor Wilson, of the Harper Adams College, in the course of a lecture on "Parasitic Diseases of Sheep," said he was sorry to have to say that parasites were on the increase, and only a week or two ago he was in conversation with certain of their big sheep-breeders in this country, and he saw it clearly indicated that if certain measures were not taken to check the advance of parasitism among sheep, many of the farms would not only be decimated, but would have to be reformed in some shape or other if sheep were to be kept upon them.

Those present, as practical farmers, knew very well that the time had arrived when they must recognise that science had come to their aid in giving them certain information with regard to those minute forms of life to which he referred, and which years ago they knew practically nothing about. It therefore behoved them, especially the owners of sheep, if the sheep were restricted to certain lands, to be as conversant with the life history of parasites as of any other department of their farming industry. If not, he foresaw great difficulties in the way of continuing their work in many cases. Some two years ago Mr. Mansell read a paper before the Sheep breeders' Association, and said :—

"It is probably well within the mark to state that two-thirds of the disease and mortality in our flocks are of parasitic origin, and that despite the vast strides made in sanitary science and our large acquaintance with the life history and habits of ovine parasites, diseases of this class are much more common than three or four decades ago, brought about in numerous instances by over-stocking with sheep, which is greatly to be deprecated."

Over-stocking was the secret of the trouble to a great extent, and that was the foundation on which he was compelled to go. Farms were sheep-fed for years and years, and the animals which lived on that land deposited there the forms of life which were taken into the bodies of other sheep which followed after them. Permanent pasture land was the hotbed or source from which those forms of life were obtained.

Parasites had to live either upon the external part of the body of an animal or upon the internal parts, and those forms of life were to be found in what were termed the "hollow cavities" of the body. The fact that they were to be found anywhere where there was an entrance from the external parts showed them very clearly they must have an independent existence outside the body of an animal prior to being taken into the body of the living animal. He was anxious to put before them certain measures with which they could combat those forms of life. Those parasites originated from an egg which, although it might be invisible to the naked eye, was revealed with the aid of a microscope. With regard to the harm which they did to the sheep, those present knew that the diseases of sheep were practically limited to a very few; and it was to be regretted that in many cases when a sheep died the farmer took no steps to ascertain the cause of death, but considered that when the animal was dead it was finished with.

The time had come, however, when they must learn by the animals which had succumbed to certain disorders what had been the cause of death. They should not allow the matter to pass over, but should find out for themselves the cause, so that they might be in a position to guard against these things in the future. He knew the kind of half-measures often taken by farmers, but in the future they must look at every shilling in connection with farming, and it did not do to take anything for granted. He would proceed to deal with one or two of the diseases to which he had referred, confining himself to those which effected the inside.

First, he would take the common tape worm, and, in passing, would remind them that the lamb was not born with parasites, but the trouble came from the peculiar way in which it took its food. They often found that when the ewes had lambed they were turned out with their lambs on to old pasture land. As soon as the little lamb began to nibble about he took into his body some of those eggs which were deposited on the blades of the grass, etc., by sheep which had been there previously. If they allowed those eggs to be scattered about by older sheep, no wonder the young animals suffered. All lambs should be drenched before they were weaned, but they should get the right kind of medicine, and not allow it to be swallowed too hurriedly.

Common turpentine with milk or linseed oil was the finest thing possible for the use to which he had referred, but they should be careful in the way they used it. If they saw the lamb falling over after the drenching they would know it was the reaction of the turpentine on the nervous system. They should graduate their medicine according to the constitution of the animals.

With regard to the use of arsenic for tapeworm, he (Professor Wilson) must tell them without bias that he had had most excellent results from the use of arsenic for that purpose, but it must be used with great discretion. Tobacco had also been used with success in the expelling of those worms.

Another very common parasite was the blood-sucking parasite, which lived on the inside of the bowel, producing scouring and disorders of the digestive system. It was most important that they should not disseminate the disease by moving infected animals from one place to another. If they did so they ran the risk of getting the whole farm infected.—"Australasian."

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The In-Foal Mare.

An in-foal mare may be worked until the day she foals if she is properly handled. If the mare has heavy work to do, work her easy. Do not make her back heavy loads or strain herself in any way. It must be remembered that there are now two lives to be supported, so her feed should be nourishing and properly balanced. In-foal mares, doing light wozk, fed on cut, unthreshed oat sheaves should be in splendid condition in the spring. Mares doing heavy work must be fed in proportion, including laxative ingredients

— Near the foaling Time. —

When the mare comes near her foaling time, she will become sluggish in her work—do not hasten, overheat or excite her. If you have the date she is to foal, you will know when to expect the new arrival. However there is no infallible rule, usually the mare shows wax on her teats a few days before foaling she becomes restless and there is an increased secretion of waxy milk, the colostrum. Be on hand if at all possible when the mare foals. If all the breeders made a practice of doing this the mortality among mares and foals would be greatly decreased. It is well to have the mare foal as early in the spring as possible, and to foal in the stable. To prevent joint ill, thoroughly disinfect the box stall where the mare is to foal. Don't be half hearted in this, clean the stall out, then sprinkle a pail or more of fresh lime over the floor, and a profusion of formalin or other disinfectant around the walls. Then bed the stall with clean straw and plenty of it. When the foal is about to arrive, examine the presentation and see if it is normal. If the presentation is abnormal, send at once for experienced assistance to have the presentation corrected. If help can be given the mare when the foetus first makes its appearance, some of the most difficult presentations can usually be corrected before the labor pains become severe, thus ensuring a live colt and a heathy mother.

— Practice Disinfection. —

When the colt has arrived, after the navel cord has stopped its strong pulsations, tie the cord near the colt's belly with a strong disinfected string. Then sever the cord. Before letting the tied navel out of the operator's hands, disinfect it with a 10 per cent. solution of commercial formalin. Then leave alone for a couple of hours. Usually by that time the colt will be sucking. — Breeders' Gazette.

Points of a Draught Horse.

A knowledge of the conformation of the horse is not so general amongst the rank and file of the breeders as can be desired. If every breeder was a good judge, there would not be so much aimless breeding, which has resulted in the production of so many inferior animal. Every breeder should make a study of the conformation of the horse, and refrain from breeding from stallions that are not built on proper lines. The construction and set of the hind legs is of vital importance in the draught horse. A great many of the diseases to be found in these regions are largely due to a wrong set of limbs. In a correctly-formed hind limb, viewing it from the side, a line dropped from the hindmost point of the slope should strike the top of the hock, and continue parallel with it until the pastern joint is reached. Addressing a meeting of horse breeders on the subject, Professor Kenny, of the Iowa Agricultural College, said that if the conformation of the leg be poor then the lower part of the leg is very likely to become curby. If the opposite conformation be present, where the leg extends backward of a line dropped as previously described, fulness of the hock, or bog spavin, is likely to result. Spavin and ring bones are very often found on legs of this kind, because of the fact that the bones do not have the proper slope in relation to each other. Viewed from behind, the legs should set in a straight line, and if there be any deviation from a straight line the hocks should be inclined together, but never outwards, as a wide-hocked horse is a drug on almost any horse market. The feet should be large, round, wide at the hoof-head, not too shallow nor too high in the heels, and, above all, constructed of good, dense horn, which indicates ability to wear well. The action of a draught horse is a point which is receiving more attention than it formerly did. A horse to command the highest price must move well. He must be good at the walk, and also do the trotting act fairly well. Length of stride and straightness of stride are the two most important points to be considered at the walk. Snappiness is essential. Height of action and flashiness are attractive, but not necessarily utility points.

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Ploughing.

In order to do good ploughing (says "Ploughman" in the Country Gentleman) the first essential is to have a correct hitch-up. First, the whiffle-trees should be made so that the evener or double-tree shall be only twice in length the width of furrow you wish to turn. This length should usually be from thirty to thirty-two inches. The reason for this is so that the plough will be in shape to stand in the bottom of the furrow, when it is in the best position to do good work. Anyone can see at once that when a team is hitched to a plough with a four-foot-evener as too many farmers do hitch, that, were you to drive across a field, the plough, if left to run straight with the draught of the team, would be in line to cut a two-foot furrow. This anyone can see is an impossibility, and make good work, so that the man at the handles, without thought, will roll the plough over to the landside in order to keep a width of furrow that can be laid in decent shape.

Second, most men are of opinion that a close hitch makes an easier draught, and in order to get the required depth of furrow with a close hitch, draw from the top, nearly so, of the plough beam. This sort of a hitch has the tendency to make the plough run very heavy, on the point and puts the plough out of position to do anything like good work; besides, it leaves the plough in a position where a very small stone will put it out of the furrow. The proper hitch would be to take the team away from the plough far enough so that the clevis can be put to draw from about the middle of the plough beam. When hitched in this manner, though, the team may be farther from the plough, the draught will be easier, because the plough will be in its proper position to lift the furrow very much easier than when running heavy on the point, and only a part of the share is doing work.

So much for hitching. Now as to the manner in which we shall make our lands for ploughing. If one is using a reversible plough he is always turning on the sod or unploughed land. But with ploughs ploughing around a land all the turning-around of the team is done on freshly-ploughed soil, and a team weighing from 2,000 to 2,600 lb. can pack the light, mellow, fresh-ploughed soil down so hard that it will take an unusual amount of harrowing to make it loose and mellow. When using other than a reversible plough, I advise back-furrowing. True with this method there are dead furrows, but with the ploughing around a land there will be the short dead furrow in the centre,and also one out on each corner, and while these corner dead furrows may be more shallow, the tramping down of the soil by the team will overbalance the other fault. But with a proper finish of a dead furrow when back-furrowing, there need be but a small showing of any dead furrow. To accomplish this, when coming to finish for a dead furrow, the last sod furrow but one should be turned only about one-half the depth that has been ploughed; from the bottom of the last sod-furrow, what is termed an earth-furrow can be turned that will make the depth of the rest of the ploughing; the next to the last sod-furrow will slide somewhat into the dead furrow, and a proper harrowing will nearly, if not quite, obliterate any depression or ditch in the soil.

* * *

Pine Plantations.

Anyone who reads agricultural notes or the other items of news from the country districts, writes the Sydney Morning Herald, must be familiar with paragraphs intimating that, on certain dates, so many thousand acres, comprising numerous blocks, will be made available for selection under certain conditions. The average reader is pleased to know that the country is fast filling up, and that the stability of Australia as a nation is assured by the even-increasing numbers of successful farms brought under cultivation throughout the land. The splendid oversea market for butter has made the small farm a success, and for production of butter, scrub land, cleared, and in grass, provides the finest pasture. It follows that the opening up of scrub lands, divided into small areas, results in the rapid disappearance of the scrub itself, and the demand for such lands is so strong that the preservation of large areas as timber reserves is a policy that any Government must have a difficulty in maintaining.

There are still magnificent assets in the shape of timber lands in New South Wales and Queensland, but the pressure of the farmer, anxious for the possession of the best dairying land is already severe, and such pressure is sure to increase as railways open up facilities for transport. The individual farmer cannot be expected to conserve timber for the use of future generations under the present regulations, and it is open to question if the locking up of scrub lands suitable for dairying for the purpose of preserving the timber growing on such land is a satisfactory solution of the problem.

For the growth of the pine-tree scub land is necessary. Nature, however, does not plant her wild scrubs with pine-trees as an orchardist plants his acres with fruit trees. Many acres may have few pine-trees, and a few acres may have many. In all timber reserves the really valuable trees are scattered, and, if brought together, would occupy a comparatively small area. Pine-trees improve, for commercial purposes, when they grow in close proximity. The sizes, when the trees have matured, are more suitable for mill requirements. Trees that have too much space are frequently too large to handle, and much of their growth has to be wasted before they can be removed from the land to the mill. The pine-trees are well adapted for artificial planting, and the occupation of scrub lands by farmers might be a means of increasing, instead of decreasing, the supply of this valuable timber, under new regulations.

With this object in view, the State should make it a condition of selection that a certain number of pine-trees should be planted for every acre selected. Instead of being scattered far and wide, the trees would be in plantations. By mutual arrangement the farmers might easily bring their plantations together at boundary-lines, and, at the end of the lease, when the purchasing terms were fulfilled, the plantations would prove their value to every farmer, and their preservation would be certain.

In many ways such plantations would be to the advantage of a neighbourhood, and a farmer who produces butter should take an interest and pride in producing the timber in which his butter must be packed to reach the market. Such plantations could be easily protected from fires, and should a fire destroy one plantation it would be confined to a limited area. Every State in the Commonwealth is deeply interested in the future supplies of good pine; and the throwing open of scrub lands combined with proper regulations for the permanent production of this valuable timber, is surely a solution of the difficulty, more reasonable in every way than the closing of lands that may not average more than one or two good trees to the acre.

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Poultry Notes.

Sunshine and Shade in the Poultry-Yard

Sunshine in the poultry house, in the coops, and in the yards is beneficial in many respects. In the poultry house it acts as a purifier, and in consequence improves sanitary conditions. Sunshine in spring is greatly enjoyed by young chickens, and the way they bask in it plainly indicates how greatly they enjoy its life giving, genial warmth. To have the coops located early in the season where they get a good share of the entire day's sunshine is healthful and invigorating. Runs located where the sun has full sway, preferably on ground with a natural slope, will rapidly dry off after a shower of rain. Such grounds will remain free from contamination much longer than level grounds or those much shaded. Though sunshine is a great destroyer of germs that lurk in the poultry yard, the fact must be borne in mind that it also brings to life plenty of proof of the poultry raiser's neglect. It is the sunshine that warms into life the vermin pests of the poultry yard. Later in the season there can be too much sunshine, both for the fowls and the growing chicks. Poultry that cannot at will have access to shady resorts during the hot summer months suffer greatly with the heat. In a few weeks' time shade will be as necessary for the welfare of the poultry as sunshine is now. Both are excellent in their proper seasons, but when fowls are, as is too often the case, compelled to exist in either sunshine or shade out of season, trouble is sure to result.

A run that cannot be too bright ond sunny in the early spring may be too much so later on. More mistakes are, however, made over an excess of sunshine than of shade. Scores of poultry yards do not have enough shade in hot weather. Where fowls have their liberty about a farm the choice of shade rests with themselves, and they will seek it not in some dark, stuffy corner, but where the air is kept stirred by the breeze around them. Open-fronted sheds when located where the rays of the sun have full play on them are only a partial success. The heat inside soon becomes stifling. The modern yards of the scientific poultry raiser—the pens of 10 hens—are provided with miniature galvanized iron houses carrying a straw thatch over the iron roof. This keeps the inside temperature within reasonable bounds, but at the same time the system leaves much room for improvements. There is no shade equals the shade of trees, for underneath their branches there is not only ample shade, but a chance for a breath of refreshing air if there is the slightest breeze stirring. One has only to note the refuges sought out by fowls running loose on farms to realize the class of shade most acceptable to them. An orchard is an ideal place for a poultry yard for fowls, as well as a very excellent run for young chicks. Every poultry keeper, however, is not so fortunate as to have orchard conveniences.

Shade of some sort being necessary, and not having been provided by Nature, it must therefore be constructed. A square skeleton shed is as good a substitute as any. Four posts in the ground, rising to a height of 3 ft. or 4 ft., can soon be provided with a framework to carry light mallee branches, broom, brush, and straw —the whole being secured and packed close with wire netting to resist the wind. The four sides are left open for the air to circulate through freely. Such an arrangement answers very well for shade, and if the ground underneath be dug up and made fine and strewn with wood ashes the fowls will use it as a dust bath as well. A gutter will need to be cut to suit the level or slope of the ground. What applies to the conditions of poultry raising in the suburbs cannot be adapted to farms where dry conditions and short supplies of water militate against growing shade trees, and it is for the latter that the square skeleton shed supplies a want. Under normal conditions there is little excuse for any poultry raiser's premises to be barren of ample shade of the most suitable kind, such as is afforded by bushes, vines, or trees. Vines grow very rapidly almost anywhere, and are at their best by the time the hot weather comes along. They not only form a shady retreat, but add considerably to the landscape effect. They can be planted and trained just where convenience suits. Planted on the outside of netting enclosures vines can be run up 6 or 8 ft. high, and spread over the yard. They can be trained to form a complete roof, and when thus spread out aloft lose none of the fruit, as the bunches of grapes will be out of reach of even the high-flying breeds. Where poultry yards can have fruit trees in them it is better to take advantage of such favourable locations in this way. Not only do the trees provide good shelter for the fowls, but the latter effectually keep down much insect life that is injurious to fruit trees. Quick-growing trees are the most desirable, those of a spreading nature being preferable, though the spreading characteristic can be easily induced by pruning and cutting back the heads to the desired shape. Select varieties that are known to do well in the district. A much-neglected tree that throws a fine shade and will grow almost anywhere is the mulberry. Poultry yards can be made not only more attractive in appearance than they usually are, but can be made to produce profitable yields of fruit, with the surplus shed by Nature to the fowls beneath. Little observation is needed to find how poor is the progress that has been made in the necessary direction above indicated, and yet the merest amateur must have frequently noticed a want of sunshine in his poultry yard when most desirable, and an excess of it when least welcome.

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Insects.

From "English Poultry."

Of the many species of insects which exist it must be admitted that certain kinds are very beneficial to poultry, but many are very injurious, and during the hot weather they increase by millions. Take the latter first. The small lice are a great annoyance, and especially is this the case with chickens. They do not so much affect the adult fowls, because they are stronger, and therefore better able to withstand attacks; nevertheless, even stock birds are greatly benefited and more able to produce their species when they are periodically examined and kept clean, than when they are allowed to run in a filthy state. It is no new subject, this one of vermin, yet it is one that poultry keepers require reminding of at this season, for if they desire their birds to thrive and be healthy they must keep them free from insects.

Young growing chickens, unless they are attended to, suffer a great deal. Many inquiries are made as to the cause of chickens not thriving as they should, and it is generally found, on close examination, that the youngsters are practically covered with vermin. Perhaps there are two or three chickens in a brood which are weaker than the others, and these will be almost sure to have 10 times the amount of vermin on them than will the strong and healthy ones. The weakly birds do not appear to have energy and strength enough to dust themselves, and so it is a matter of impossibility for them to thrive, for not only do vermin suck the blood, but they derive a great amount of nutriment from the shooting quills, naturally to the great detriment of the victims.

It may appear a broad statement to make, yet it is nevertheless true, that more chickens are killed through insect pests than nearly all diseases that fowl "flesh is heir to." The birds are so weakened by these mites that they are very susceptible to many ailments, and where chickens have been practically killed by lice, a post-mortem examination will reveal the fact that the gall-duct of the liver is very full, in some instances having overflowed or occasionally burst so that the liver could not act properly. When chickens are infested their feathers generally appear to be rather rough, their eyes are pale all round and sunken, and there is a line under the eye that gives the bird a peculiar appearance, as if the beak were too long for the head, and the wings too long for the body; the flights and the horn of the beak grow, but the body appears less in proportion.

Even when the chickens appear strong and healthy it is well to catch one or two occasionally and examine them very closely, and at the least signs they should be well dusted with insect powder so as to destroy what few insects there are. The birds with a large number of vermin on them should be well dusted twice, the second dressing being about five days after; the second dressing is necessary, for the first does not destroy the nits. When dusting a chicken it is best to lay it on its back on a large sheet of paper, then part the feathers, and shake the powder so that the whole of the skin is covered with it; turn the bird over and rub the preparation well into the ends of the flights among the quills and also under the wings. After they have been well dusted the powder should be knocked off the surface of the feathers with the hand on the paper, so that if possible it may be used for the next chick. Common insect powder will cause the chicken's skin to become white and scurfy and very tight upon the body. The best to use is pyrethrum.

The stock birds should be dusted in the same way as the chickens, especially those males which are required for the breeding pen next season. It would be well, too, to dust them when they are moulting; if not, the vermin begin to attack the new feathers, particularly those in the tail. When this happens the feathers do not grow properly, and when they do eventually develop they lack the beautiful gloss they otherwise would have. Examination of the fowls' tails will reveal the fact that the feathers have a lot of little marks crossways upon them, as though a moth had been eating part of the web. Exhibitors should always remember to overhaul their stock males, for the vermin not only damage the tails, but they seem to take the very life out of the birds, making them most unsuited for breeding. No matter whether the fowlhouse is kept scrupulously clean or not, vermin will accumulate if the birds themselves be not properly tended.

At the beginning of these notes it was stated that there are insects which are very beneficial to poultry, and during the summer

KOONOOWARRA POULTRY YARDS.

Barred Plymouth Rocks: Special Exhibition pen. Ckl, 1st and Sp. at Victoria P. & K. C. Show; 1st and Medal Essendon Show, Vic.; 1st and Sp. Adelaide P. & K. Club Show, 1911; Hens and Pullets, all winners, P. & K. C. Show, Adelaide, 1911. A limited number of settings only. £2 2s. per setting.; Good Utility, £1 1s.

Buff Orpingtons: Birds have won prizes whenever exhibited. Good sound color and healthy stock; also good winter layers and splendid birds for Export trade. 10s. 6d. and £1 1s. setting.

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Eggs securely packed and delivered on Rail or Coach (buyer pays carriage). All Eggs Stamped Koonoowarra. Infertiles replaced once.

Terms: Cash with Order. I keep nothing but A1 Stock. I cull heavily and breed only from the Best.

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months there is an immense number of various kinds to be found upon the surface of the soil, which make the very best food that adults and growing chickens can have. It is remarkable how chickens that are hatched and living right out in the open, and which have to collect their own food, grow much quicker than do those which have been confined and carefully fed on good food. Of course, if the ground is overcrowded with chickens, they naturally require feeding, but those which get plenty of insect life do better and feather faster. It will be found that where chickens are allowed to run in fruit plantations, the owners will not require to syringe the trees to keep them free from insects. When syringing takes place a large number of insects drop to the ground, and where there are not any poultry running about the insects creep up the stems again.

During the past few years our scientific gardeners have shown that in certain species of insect the male flies, whereas the female creeps from tree to tree and deposits her eggs in the bloom. The eggs hatch while the fruit is growing, and the maggots destroy the fruit. Now, if chickens were kept in the plantation the females would have no chance of getting from stem to stem, as they would be easily caught. Granted, the wild birds feed upon these pests, but they do not keep them under sufficiently; and if large flocks of chickens, ducks, and poultry were allowed to run in these places, they would not only keep the trees in better condition, but they would find a great part of their living. This practice of allowing feathered stock in the orchards and hop gardens is coming more into vogue, and it is a system that should be strongly advocated. The wider range a farmer or fruitgrower can give his chickens the faster they will grow, and the less they will cost for food.

Ducklings are useful for the purpose, and not only do they catch flies, but they are the best workers imaginable to keep down wireworms and slugs. They have the advantage over chickens of being able to find the insects before daylight. The best plan is to put about 20 ducklings on 30 or 40 square yards of ground, and to wire them in for several days, so that they can thoroughly clear the ground. The wire need not be more than 18 in. high, and small pegs will be ample with which to fasten it down, so there is very little labour attached to fixing and removing it.

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Worth Remembering.

Weeding out should now have been thoroughly done. If it has not been, continue culling. The more room given to the pick of the flock the better for all purposes.

Both young and old poultry, to progress satisfactorily, require as much attention now as at any time of the year. And that attention must be regular.

Do not neglect the young stock for a while, and then attempt to force them forward with special condiments and dieting.

Keep the youngsters steadily growing. See that the cockerels are allowed to develop their frames so that they may be fitted for breeding purposes. Let the pullets be so managed that they will store within their systems the material requisite for a continuous supply of winter eggs.

Do not permit young stock of both sexes to run together until they are fully matured. Separate the males from the females as soon as you can differentiate between them, and keep them as far apart as possible.

The separation of the sexes must be done cautiously. It often happens that advanced cockerels will pine if taken from the flock and placed alone. But this may be avoided by separating the birds at from two to three months old, and being particular to see that they are well fed at first.

Do not allow the forward cockerels to mix with adult hens. It results in premature ageing; and it is most liable to injure the bird's constitution as a breeder to be allowed to run riot at an early age.

Do not limit the half-grown flocks to small quarters and permit the adults free range. Reverse that order of things.

There is nothing better to encourage the development of bone and muscle than unlimited exercise.

Avoid overcrowding. Do not permit large broods of chickens to sleep together in an ordinary fowl house. Let them lead an open-air life, night and day, and do not worry if the stock takes to the trees at night.

See that the adults are gradually casting their "threadbare clothing," and growing that which is new and strong, so that they may be able to withstand the inclement weather they will have to encounter ere many weeks have passed.

The stock birds should have been separated. Keep the sexes apart until the birds are required for the breeding pen.

Let the food be sound. Provide ample variety, and avoid a fattening diet. Where there is a lack of lucerne compensate for it with a practically unlimited supply of fresh green vegetables.

Keep the birds and their haunts clean. Young stock cannot possibly thrive if parasitical vermin get the upper hand.

Provide chickens and young turkeys with dust baths— holes or heaps. Give goslings and ducklings for stock plenty of swimming water.

WANTED TO SELL.

INCUBATORS AND BROODERS, Simplex, awarded first price (silver medal) Adelaide Exhibition, 1910. Agent for Cort's Patent Cooler-safe, a boon in summer. Send for price list.—D. LANYON, Manufacturer, 46 North Terrace, Kent Town. 6-12.

Eggs! Eggs!

Sittings from Heavy Laying

White Leghorns
Black Leghorns
Black Orpingtons
Silver Wyandottes

15 Eggs to each setting. Guaranteed fertile or replaced. 10/6 per setting.

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Hatching and Rearing Turkeys by Artificial Methods.

The following results obtained in an experiment conducted by the Washington (U.S.A.) station, on hatching and rearing turkeys by artificial methods should prove of value to those who desire information on the care of young poults.

—Setting the Machine.—

One hundred and two turkey eggs of the Mammoth Bronze variety, which nicely filled the tray of a 150-hen egg incubator, were placed in the machine, which had previously been warmed in the usual way, and at the time the eggs were placed in the tray the thermometer registered 102 degrees. The moisture pan, which was the same size as the tray, and located beneath and 2 in. from the tray, was supplied with sand one-half in. in depth, which was thoroughly saturated with warm water. This sand was kept wet enough to show puddles of water on its surface at all times during incubation by daily applications of water heated 100 to 103 degrees F.

—Turning the Eggs.—

The eggs were turned once every 12 hours—morning and evening—beginning on the third day after they were placed in the tray, and continued until the first sign of hatching, the pipping of the egg. The turning was very carefully done by first removing from the centre of the tray about 1 dozen eggs, and then carefully rolling, with the hand, the remaining eggs toward the centre of the tray, just enough to change the position of each egg. The eggs that had been removed were then placed in either end of the tray.

—Temperature.—

During the first week a temperature of 102 degrees was maintained, and afterwards 103 degrees, with but slight variations.

—Testing.—

On the tenth day the eggs were tested for fertility, four clear eggs being found, which, with the three that were cracked in transit, left for the machine just 95 eggs. Of these four more were taken out at the second testing, which occurred on the twentieth day. Thus we had 91 eggs that had stood the test.

—Hatching.—

The first evidence of hatching occurred on the evening of the twenty-seventh day, and by the evening of the twenty-eigth day the hatch was complete, resulting in 87 poults—four had died in the shell. The day following the hatch the incubator door was left ajar about one-eighth of an inch, which was increased the second night to one quarter of an inch. This was done to gradually harden the poults in their preparation for the hover.

—Brooding.—

During the afternoon of the second day after the hatch the poults were placed in a hover in the brooder house. The hover had been warmed to a temperature of 90 degrees. The poults appeared well and bright. All were placed in one hover, which proved to be a mistake, for the following morning there were several dead ones, caused by the young things deserting the hover and piling up, many of the underneath ones being smothered. About 30 were thus lost in a few hours.

When reared in the natural way and seeking to be hovered, the poults instinctively duck their heads and creep under the mother hen, while she assumes a settling position. The poults having thus asembled they become distributed among the feathers and under the wings of the hen. The warmth from the hen's body satisfies them. They become quiet. Deprived of the mother hen they bunch when, in their search for warmth, a scramble ensues, each poult making a desperate effort to get under the bunch. In the struggle they become surprisingly entangled, causing a condition that brings death to the weakest ones from smothering.

In order to save the remaining poults they were divided among three hovers, which ended the losses. These hovers were at first kept at about 90 degrees temperature for about a week, when they were reduced in temperature about 10 degrees weekly, until down to 70 degrees, which temperature was maintained until the poults were about six weeks of age, after which time they do not require artificial heat. They were permitted to occupy the hovers for a couple of weeks longer, when the hovers were removed entirely. Care had been taken in keeping the hovers scrupulously clean by removing the dirt and supplying clean chaff. After removing the hovers, the poults were confined to their nursery rooms, each 4 by 12 ft., with an outside runway 4 by 20 ft. It was found necessary to provide additional runways as they rapidly outgrew those they were occupying. At four months of age they were given their liberty. They would not range, nor travel but a few rods from the place where they had been confined.

—Feeding.—

Unlike chickens, the young poults appeared not to know where to find their food. Teaching them to eat promised to become quite a problem. Failing to attract them to their feed in other ways, a few young chicks were placed in the nursery with each flock of poults. It was surprising how aptly they took their first lessons from the chicks. Within one hour the problem was solved, and all were feeding and drinking with no further trouble. The first feed was stale bread, moistened with sweet milk, chopped onion tops, grit, and pure water. At

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have twice won Roseworthy Egg-laying Competition.
World's Record for placing the first five pens in Blenheim Competition 1906-7, 100 pens competing.

I am offering eggs from Roseworthy winners at a very low figure to the first 20 applicants. This pen beat all Australasian Competitions held in open yards for 1908-9.

High class stock and eggs in season satisfaction guaranteed.
Telegrams—"Ontario."

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this time the poults were nearly three days old. About three days later their bread feed was gradually changed to commercial chick feed, cooked milk curds, and lettuce. Three or four days later there was added to this feed dry bran and beef scraps—five parts bran to one part scraps—mixed and placed within their reach in shallow boxes, which was kept before them all the time until they became five months of age. A convenient hopper for this dry bran feeding we find to be a 4 ft. long, 6 in. wide, and 6 in. deep, with a strip 2 in. wide nailed lengthwise and in the middle along the top. Supply this hopper daily, just enough for a single day's feed—all that the poults will eat. Fresh green stuff, such as lettuce, kale, or cabbage, was fed liberally daily, morning, noon, and evening; also sweet milk and fresh water. The drinking vessels were washed clean daily. A box of gravel and cracked shells and a dust bath were kept in their nursery. From the time they would pick up oats, corn, or wheat their grain ration consisted of equal parts of these grains, mixed and scattered in the runway three times daily, as much but no more than they would eat. We regard that the most surprising thing in connection with the feeding was the small quantity of these grains consumed, which was evidently due to the very liberal supply of milk and green stuff provided.

—Preparing for Market.—

Two weeks before these turkeys were to be marketed for the Christmas trade they were weighed separately, when one-half of the number were divided into lots of four each and placed in darkened pens, admitting the light only at feeding times, while the remaining one-half were confined in roomy roosting quarters, having a runway of 20 by 50 ft. These quarters were not darkened in any way. Both lots, in lieu of the mixed grain and dry bran feed, were fed three times daily of the following fattening ration all they would eat—making the change gradually:—6 parts corn meal, 2 parts middlings, 2 parts beef scraps, by weight, and moistened with milk. The green feed was fed as before.

This experiment lasted two weeks. The birds that were confined in darkened pens made no gain whatever in weight, while those birds that had more liberty gained 2 lb. and 2½ lb. each. These birds were marketed when a little more than 5½ months of age, when the pullets weighed 13 and 14 lb. each, and the toms 17 to 19 lb. each, live weight.

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Eggs.

An ordinary hen's egg is scarcely the sort of thing we are accustomed to become enthusiastic over, either on account of its beauty or its mystery, its remarkable strength or its composition. Yet I venture to think there are few more wonderful things in Nature; and were eggs as rare as diamonds we should regard them with an equal amount of respect. Nearly every one seems to think that the chief and perhaps only important function of an egg is for consumption, and that it has been specially invented by a thoughtful Providence to supply the human race with an appetising dish for breakfast. It appears to be forgotten by such that the main value of an egg is not to accompany any bacon or ham, but that its natural purpose is solely for the reproduction of the species.

The mysteries contained within an ordinary hen's egg have defied the investigations of scientists and naturalists since the world began, and they still defy them. There is the mystery of variation. Two eggs, identical in shape, size, and colour, produce chickens that are altogether unlike; one egg will bring forth a bird of pure white plumage with yellow legs, and five toes, while that from the other will possess all the colours of the rainbow in its feathers, and it will have black or white legs and only four toes. What the differences are within the shell to cause these remarkable variations no one can even guess. Then, too, the differences in the colouration of the shell are striking. Some hens always lay white eggs, while others produce ones with brown shells. The reason one hen should lay only white eggs and another only brown eggs remains to be discovered, as notwithstanding many attempts in this direction in the past the riddle has never been satisfactorily solved. The determination of sex is also worthy of note, though this does not present quite the same difficulties as does the determination of colour of plumage or shell. But of all the mysteries the most remarkable is that of the origin of life. Of all the wonders of a wonderful nature there is none to equal this. It is a problem to which men have freely devoted their best years, but which has baffled all their skill and all their labour. The questions as to what life is, how it originates, and how it develops must for the present, at all events, remain among the unsolved mysteries.

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Give all waterfowl as wide a range as possible, and do not forget that their natural exercise is obtained on the water. A pond or some means wherein they can swim, are most beneficial for goslings and ducklings.

If stubble land is available take advantage of it. There is much shed grain and insect life to be obtained for the seeking. It will prove a more profitable diet for poultry than for birds of the air.

TICK

South Australian poultry owners have found that the very best remedy for the TICK CURSE is

Faulding's

Phenytas.

Periodically dip the infested birds and spray infested houses and runs with Faulding's Phenytas and there will be no further fear of tick.

FAULDING'S PHENYTAS is Absolute DEATH TO THE TICK

Work for the Month.

The present is an opportune time to use the whitewash brush. Warm weather is conducive to the production of vermin. During hot days and similar nights "lice" breed in battalions. Lime and lice do not agree. Fowls and lime do.

Lime is a good insecticide as well as an excellent purifying agent. Use it freely. Undertake the work just after sunrise. It is too much like "hard labour" to do it in the middle of the day. Moreover, a house washed out in the early morn will be ready for the fowls at sundown.

Carbolic acid may or may not be added to the limewash. In any case it is an excellent article to use once a week or so about the fowl house. And, expense and efficiency combined, it has not a superior as a disinfectant. Buy the crude article—it is just as efficacious as, and much cheaper, than the refined acid.

Limewashing is dirty work at the best. Unless the "operator" is an artist, the lime has a habit of bespattering one from head to foot. Then, again, it has been said that the brilliancy given off when the stuff dries injures the eyesight of the fowls.

Let the birds dust. A dust bath is a good means of ridding poultry of the large lice which infest their bodies. But it must be properly done.

There is more than one way of making a dust bath, and also of inducing the fowls to take to it. Nothing, however, is so good as earth. It must be dry, but not too powdery, and put under a cover of some kind to prevent it becoming wet. A bushel or thereabouts will do for a dozen or more fowls dusting in for a considerable length of time.

Rake the earth into a heap, or on a grass run take out a large turf and loosen the ground with a fork. Some fowls appear to have very little inclination to scrape on the level ground, but as soon as an elevation of any loose material or a hollow is placed within their reach, they go into it with energy. It always induces fowls which are backward in dusting to pass through the dusting process.

If any birds appear languid and off their food, which sometimes happens with those that make rapid growth, it is well to administer a tonic. One of the safest pick-me-ups that can be given to young stock is Douglas's mixture. The dose is in the proportion of a teaspoonful to each half-pint of drinking water. The mixture may be supplied to the birds every third or fourth day.

Fresh green food, of course, will generally set matters right when ordinary meal and grain fail. In fact, fowls will at times leave their mash and corn to partake of it. Green food is often wasted for no other reason than that is it not given to the birds in a proper manner. And especially is this so with watercress, dandelion leaves, and other small varieties.

The ingenious poultry keeper should not have waste of food of any kind, not even a dandelion or a lettuce leaf. Wasted food means soiled food, soiled food decomposing matter, and decomposing matter bad odours, loss of condition, and disease.

Get some string nets made of half-inch mesh. Drop the green dainties into a net, draw the string, suspend it, and the birds will delight to eat therefrom, because the contents are not trodden underfoot nor soiled in any way.

Such a method acts admirably for birds in small pens, and in the case of those in exhibition coops it is most economical as well as cleanly. A net may be suspended in one pen for a few minutes, then removed to another, and so on. Surprisingly little is dropped by the birds.

Leg weakness is apt to make its appearance if the growing stock is unduly forced. Cockerels generally suffer more frequently than pullets in this respect. The bird is more or less incapable of holding itself up, and often sinks to the ground. In severe cases it is unable to stand.

Cramp has been confounded with leg weakness, but the two ailments are distinct. It can be taken as a certainty that if several birds lose the use of their legs, and they are being kept in a damp place, the trouble is cramp. On the other hand, if only one bird is so affected more especially if it is of the heavy breeds, the complaint is leg weakness.

When a chicken has cramp it will be noticed to walk stiffly or "gingerly," and the symptoms will soon pass off when warmth and free circulation to the part are restored. With leg weakness, beyond the symptoms already mentioned, the bird, when it attempts to walk, does so in an awkward manner, and the "knees" knock together, the joints appearing weak.

The best treatment for leg weakness is to allow the bird a good supply of nourishing food.

THE DIFFERENCE IS JUST THIS: WHEN YOU USE

Burford's Prize No. 1 Soap,
Burford's No. Starch,
Burford's Extract of Soap,

YOU SAVE YOUR MONEY.

WHEN YOU USE A SUBSTITUTE THE OTHER MAN SAVES YOUR MONEY.
DON'T LET HIM HAVE IT.

Barley, ground raw bones, and chopped meat, with plenty of fresh green food are excellent, and should enter largely into the diet. As medicine administer steel solution; or give the birds pills composed of phosphate of lime five grains, sulphate of iron one grain, sulphate of quinine half a grain, and strychnine one-sixteenth grain. Such a quantity will make a doen pills, and the dose is one pill a head per diem. The sufferer should be kept in a dry place, and its legs may be rubbed to restore circulation.

Chickens that are growing freely and have not been forced with condiments should be allowed to perch whenever they feel so disposed.

A perch should be fixed in the run about a foot from the ground, and provided it is slim and round and can be grasped firmly the breast bones will not be injured. Morever, a perch will prevent the chickens crowding, which they assuredly will do if forced to rest on the floor.

Keep an eye on the adults that are moulting. As a rule the moult is a gradual process of shedding old feathers and growing new ones. Some birds, however, cast their feathers too quickly. They become practically denuded within the space of a few days, and the new feathers not having grown sufficiently to protect their bodies, they may easily develop colds and other ailments, especially during unseasonable weather.

If there appear to be any difficulty regarding the formation of new feathers, the skin should be kept well moistened with plain, ointment—clarified lard being as cheap and as efficacious as any. Such a state of affairs is, however, generally due to wrong feeding, so it is better to see that the food is suitable in the first place.

Those poultry keepers who intend to increase their stock, and others who contemplate going in for fowls, will find the present a most suitable time to purchase the necessary birds. Breeders have generally a big stock of really good fowls to select from, and they can afford to take less for them now than after the winter.

There is a certain demand for young table fowls during the holiday season at seaside resorts, but, as a rule, this demand is not one to bring in a very remunerative price, and those poultry keepers who have really good young fowls to dispose of will find it pay much better to sell them at home.

◆

Luck

In all occupations it is the strict observance of business principles, that results in success. Raising poultry is no exception to this rule, says a writer in the American Stockkeeper, and those who have and are making the business a decided success are merely reaping the reward that follows the faithful application of "strictly" business methods. So-called "luck," good or bad, is the effect of proper or improper methods.

The successful man rarely ever credits his good results to luck, for he knows that they are brought about by well-directed efforts in accomplishing the many things upon which he knew that success depended. It is a matter of wonder that men of intelligence, who know perfectly well that certain things are necessary to observe, will half observe or carry them out, and then, when the natural results of cause and effect follow, lay the poor success on "luck." "Luck," so-called, is thus made a ready excuse for all manner of carelessness, shiftessness, incompetency, laziness, and sheer ignorance.

Success in poultry culture is no haphazard affair but is secured only by regular methods, and the closer the application and more careful and earnest the effort the greater becomes the success. There are others who succeed well with a few, but make a sad failure when they try large flocks. A well-known fancier has said there are few "thousand hen men"—meaning that there are few men who are competent to successfully handle poultry in great numbers.

Among the reasons why many poultry raisers fail to meet with success when they increase their flocks are the following:—They fail to increase their accommodation in proportion to the increase in the flock; they fail to recognize the fact that large flocks are difficult to feed so that each bird may secure its allotted share; that various ailments have to be guarded against where large flocks are kept that are comparatively unknown among moderate-sized flocks; that large flocks require constant attention. Neglect should never be allowed, however, in any flock.

The man who has attained success with a fair-sized flock should be very cautious how he increases it expecting to thereby proportionately increase his profits. He should make a careful note of the facts that have resulted in securing his profits. How he can increase his flock without disturbing the situation or weakening the factors that have crowned his management of his small flock with success should be his first consideration.

In most cases it will be wise to "let well alone." If an increase is to be made in the flock, let additional accommodation for another flock be provided, and as far as possible let them be similar to those that have produced such satisfactory results already. In this manner, by a sort of colonizing plan, the energetic and ambitious poultry raiser may increase his poultry flock with a good prospect of additional profit.

There are men who do raise poultry by the thousands, and with a percentage of loss not much greater than those who raise a few. Their success is due to their personal attention and the strict observance of proper feeding, good housing, sanitary conditions—in fact, the carrying out of all the little things in careful detail that an extended experience has taught them is necessaary. They never give their success any credit to "luck."

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LADY IN ATTENDANCE.

Pigeon Notes.

S. A. Canary and Pigeon Society.

The Hon. Secretary (Mr. C. W. Creer), kindly sends the following report:—

Of the second young bird show held at National Hotel, Saturday afternoon, January 13th, which was well attended, Mr. Creer writes:—There were a few old fanciers present who have been very quiet of late, but who seem to be livening up again. There was also a good sprinkling of new fanciers, and the entries show a falling off of five from last show. The cause, no doubt, is having to show different birds each time, making it necessary to keep breeding on, as all birds have to be under the age of three months. Still, up to date, these shows have been a great success, and the society are in hopes of having a record entry next month. Fanciers are taking a great interest, and competition has been very keen, some tiptop youngsters having been shown. The scoring for the young bird cup is fairly even, there being three or four two points behind the maximum, while two others have scored the full number. The judging was in the capable hands of Mr. J. A. Chas. von Einem for pouters, carriers, barbs, magpies, fantails, blondinettes, and African owls, and Mr. J. Koerner for dragoons, working homers, jacobins, and any other variety, and Mr. F. W. Hocart canaries.

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Hamilton, S.A.

The judges' remarks were as follows:—

—Canaries.—

Crests. — Competition very good, first and second very close, second bird a little too open in crown. Third, grizzle crest, nice type, crest good shape, feather poor. Crest Breds.—First a real good bird, second also a good specimen, these two stood well away from others in class (this was the largest class in canaries, with eight entries.

Novice—Crest, poor specimen. Crest bred, fair for a novice. Altogether they were a good lot. Although young canaries are not too numerous this year, there have been some very good birds shown at these shows.

—Pigeons.—

Pouters—A good class, winner stands out in length of limb and markings, and should make into a good bird. Carriers.—Winner a very promising bird, with good length. Barbs.—Winner shows quality, should make up well with age. Dragoons—Largest class in show. We are getting a lot of new fanciers in this variety. This class contained some fine birds. Winner carried good skull and carriage. Second very close, good type and colour, third fair, a little long in face. Jacobins—Winner a nice red, with grand wealth of hood, second a very fair black. Magpies.—Showed fine quality, and would take a lot of beating anywhere, winner stands out in length of limb and face, with a good fish eye and good cere. Fantails.—Only a fair lot. African Owls.—Winner good skull, beats second in shortness of feather and body.

—Bantams.—

Game.—Winner stands right out, a wonderfully good pullet, two and three ought to be heard of later. Variety.—Three real good Sebrights shown by a novice, who should make a name for himself in this beautiful variety.

—Prize List.—

—Canaries.—

Crests—1, Clarkson & Marshall; 2, H. R. Hammer; 3, W. L. Shaw.

Crest-Bred.—1 and 2, H. R. Hammer; 3, W. W. Stally.

Novice Crest—1, R. Spinkston.

Novice Crest-Bred.—1, R. Spinkston.

—Pigeons.—

Pouter.—1, E. Hefron; 2, Hall and Porter; 3, C. W. Creer.

Carriers.—1, H. H. F. Miller.

Barbs.—1, H. H. F. Miller.

Dragoons.—1 and 2, C. W. Creer; 3, H. L. Chase.

Working Homers.—1, H. L. Chase; 2, V. Allsop; 3, H. L. Chase.

Jacobins.—1, R. A. Stobie; 2, A. H. Cartwright.

Magpies.—1, 2, and 3, T. Koerner.

Blondinettes.—1, H. L. Chase.

Fantails.—1 and 2, D. Hayward.

African Owls.—1 and 2, A. E. Miller.

—Bantams.—

Game.—1, 2, and 3, D. Cruickshanks.

Variety.—1, 2, and 3, V. Allsop.

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The Fantail.

[By D. M. Hayward, at S.A. Canary and Pigeon Society.]

This beautiful pigeon is of ancient origin, and can be traced as far back in history as most others.

It is generally supposed that the Scottish fancier was the first in Great Britain to import the breed from India, where as far as can be ascertained it originally belonged.

At this time the birds were generally known as "Shakers," presumably owing to the tremulous motion of body and head; but the name was subsequently altered to that of "Fantail," and it was to this latter property the Englishman evidently paid most of his attention, every other point apparently being sacrificed to that of tail, the bird with an enormous tail, from his point of view, being the first and last thing in fantails, and I am afraid that to a certain extent, many of our present-day fanciers and judges share this antiquated idea of the early Englishman.

Do not think that I have no regard for a good big tail, I quite appreciate, and am aware of the necessity for same, but do not consider it everything. All other things being equal I would, of course, give the bird with the better tail the first card every time, but would not allow this one point to outweigh all others.

To return, however, to the early fanciers. The Scotchman evidently had a keener and better educated eye for all round beauty than his English brother; and whilst appreciating, as we all should, the importance of a good tail, he did not allow this one point to unduly sway him in his judgment, but endeavoured to establish a strain of fantail of all-round excellence, namely, nice, fine head and neck, small body, well rolled up, with head well thrown back on cushion, nice circular tail, but carefully trying to avoid any suggestion of the pot lid variety.

This difference of opinion between the English and Scottish fancier naturally evoked a good deal of feeling, especially at show time, and as the breed at this period was a comparatively new one in Great Britain the judges were rather at a loss to know how to act, and to keep right with all parties divided the prizes between the two types.

This, of course, could not continue, as there could only be one correct type, and in time the neater and smaller bodied bird with, of course, due regard for tail, was accepted as the correct thing, and the big coarse bird with large tail rejected. The firstnamed is the bird we see or expect to see winning at our present-day shows.

In support of the contention that the tail is not everything in a fantail, I would quote an extract from the judges' report on two of the first prize birds in classes of 15 and 11 at the Manchester Show, England, held in 1910. The Manchester Show I would mention, is one of the six most classical shows in Great Britain, and ranks next in importance to the Palace and Dairy.

"Fantails" (Judge, Mr. J. W. Weightman. In the red-yellow class Mr. J. Taylor, a new recruit to the none too numerous band of breeders of these colours, penned a little gem. In body, carriage, legs, head, and neck points this hen was far ahead of anything I have previously seen in these colours, while its colour was sounder than is usually found in a yellow. Its tail left a lot to be desired, and some might cavil at such a small-tailed bird being put first, but, taking into consideration its wonderful body properties, I had no hesitation in giving it the premier card. Also winner in another class is described as "a grand little black, stands right away, might have little more tail, otherwise a gem."

And now having dealt briefly with the origin of the fantail I will endeavour to apportion the points according to my idea of importance.

Head.—Small, fine, and snaky.

Beak.—Thin and of medium length, the upper mandibil slightly curved at tip like that of a dove.

Colour of Beak.—Whites, saddles, reds, and yellows, flesh colour; blues, silvers, and blacks, black.

Beak Wattle.—Small and fine in texture.

Eye.—Whites and saddles, dark hasel or bull. Blues.—Silvers, blacks, reds, and yellows. Pearl—Gravel or orange, the former preferred.

Eye Cere.—Very fine.

Neck.—Thin, swan-like, tapering well off as it approaches the head.

Length of Neck.—Corresponding with length of back, so as to enable the head to rest closely on the cushion.

Body.—Shape, small and round. Back, slightly hollowed in centre, length of back corresponding with length of neck so as to enable head to rest closely on cushion. I might say here that if the back is too short, it causes the head to push through the tail, which is one of the worst faults a fan can possess. Rump, small, but of sufficient size and strength to balance the tail evenly. Chest broad, round, and free from hollowness, except a slight parting in centre. Breast, round and full.

Wings.—Set off fairly low, and very closely tucked in at the chest, flights of medium length and well closed.

Cushion—Full and massive, the feathers at back closely overlapping each other, and spreading well over the tail feathers.

Tail.—Slightly concave and circular, filled with long, broad, evenly-set feathers, closely overlapping each other, and as thick as possible in centre. The tail must not be of the potlid style, that is, carrying it flat over the head, nor must it be ridged or twisted in any manner. Both of these faults are bad and hard to breed out.

Legs.—Moderate length, not stilty, set well apart, and free from feathers below the hock. Feet small, fine, and neat. Colour of legs and feet bright red.

Plumage.—Feathers hard and tight fitting.

Carriage.—The bird should stand on tip toes, with body well rolled up, and walk in a jaunty manner, head thrown back in a graceful manner, resting closely on cushion and head, and carried on either side of neck. Chest upright, so as to carry the breast almost in a straight line with legs. Flights just clearing the lowest tail feathers, and almost meeting at tips. Tail carried well up, not being allowed to droop or incline forward.

Motion.—Convulsive jerking or twitching of neck, and apparent upheaving of chest. General appearance, closely built.

Colours and Varieties.—Whites, blacks, blues, silvers, saddles, reds, yellow, and laces.

—Points in Judging Fantails.—

Head and beak (fineness)	3
Body, smallness (4), shape and carriage (9)	13
Motion, continual, nervous, tremulous	10
Tail, size (6), shape, flatness, uprightness, and completeness (6)	12
Flights, position of, free from tail	2
Total	40

(Continued on page 432).

How to Breed the Crested Canary.

— A paper read by Mr. W. L. Shaw before the South Australian Canary and Pigeon Society. —

In a paper of this character there is not room for a long detailed account of the whole system of breeding. Still, I will try to place as much matter before you as I possibly can, which, I trust, will be of some service to the young fancier.

The great secret of success is a good start. The first step is the careful and judicious selection of useful breeding stock. This is most important, far more so than many consider, if success, either on the show bench or in the breeding room is to be achieved. In selecting stock, be prudent. One single rash action at this time may foil all your plans. Do not rush to buy the first bird you see but carefully look through the stocks of several fanciers ere you decide. Endeavour to carry the points of the different birds in your eye, and purchase from what you think is the best stud you have seen. If you start with a couple of sets I would advise you to select a variegated buff crest-bred cock and a couple of buff crested hens for your first set. one of the hens to be clear and the other ticked. In the second set I would have a crested cock, and two variegated hens, one crested and the other crest bred, thus with one hen out of your four, you have double crest blood. In double cresting be careful to see that both crested cock and hen are perfectly level in crest and filled in at the back of the head. Strictly avoid any slackness of feather, for in this point they should both be moderately neat in body feather, not too fine and not too coarse, but the most important point is the head. Birds selected for double cresting should have as near as possible perfect crests. In breeding in this manner the chances are that you will breed a few mop and rough headed birds, but if you are fortunate enough to succeed in getting a few regular headed birds you will be well repaid. The rough headed ones obtained are by no means to be despised, for they make good useful stock birds and can be paired up with young from the other set. By a judicious use of the mop headed double crested birds you will be enabled to build up a strain that should prove of much service to you. The crest bred plain heads obtained from the double crests will be invaluable for breeding purposes, and great store should therefore be set on them. The second season, if your first breeding operations have been successful you will naturally have more pairs to work with. Size being an important consideration in Crested Norwich the most important of all points in breeding Crests is the selection of the Crest Breds. In selecting this bird have the proper shaped head and good feather, this to my mind is one of the main roads to success. The feather of a good Crest-bred when turned over with a coin, should cover the whole beak. But unless a Crest-bred has a nice equal spread when turned over, it is not of much value. In the breeding of good Crests it is also an advantage if the Crest-bred is descended from a first class Crested strain. By strain is understood that the Crest and Crest-bred blood has been thoroughly intermingled, and has been carried out on well thought out lines. I always endeavour, as far as possible, to breed my birds together, so that it is just as possible to breed as good a Crest as Crest-bred, and in this I have been very successful, but I have found that it is always policy to favour the Crests, for as breeders well know more Crest-breds are bred than Crests, so that it pays to favour the Crested. I have in some cases succeeded by in breeding, but my chief guide has been selection, by this latter means I have been most successful. I always found that in breeding was only useful when carried out on very moderate lines, and to carry it on season after season is what I term suicide. It is only when inbreeding is resorted to as a means of stamping the good points into our strain that it is made legitimate use of.

— Scale of Points for Judging Crested and Crest-Bred Canaries.—

Clear Body with Crest of any Colour.

	Points. Maximum.
Form of individual feathers, ovate	5
Fall of feathers, radiating and drooping	5
Position and centre filling	5
Front of crest: broad and round	5
Sides and back of crest: well filled in	5
Size of crest, length of feather, quality and area	10
Density of crest, quantity of feather	8
Colour of crest, for purity of its kind, birds of equal merit with dark crests to take precedence over grey or clear	7
Colour of bird, depth and purity	20
Feather, compactness of body feather and carriage of wings and tail	10
Size and shape	10
Condition	10
	100

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The Other Fellow's Point of View.

Selfishness is the great sin of the human race selfishness is putting one's opinions first on every occasion. A gentle spirit of forforgiveness is the result of unselfishness, and if one more often would try to put oneself in the other person's place and get his view point we would be more forgiving and charitable toward one another Many a person's actions are judged harshly simply because we take our own point of view and not the other person's. If we would look at ourselves more often, if we could see ourselves as others see us, there would be heard less criticism of others. Read this:

"Have you ever found yourself positively disliking someone, and if you have, have you ever settled right down to analyze your own conscience and find out why you dislike them? It is really a very uncomfortable experience, for in nine cases out of ten we are not justified in the hard feelings we have of people and we need only be candid with ourselves to be convinced of it. I have come to believe that it is impossible for us to dislike a person without doing him an injustice. We are so critcal of everything he does and says that we are sure to misinterpret and condemn the very things for which we freely make allowance or overlook entirely in other people. And when we do find something to be condemned we are often positively pleased. Now, isn't that true?

"And how often are we tempted to do or say unkind things to this person? Perhaps we would not admit that they were unkind, but probably we would count them so if they were aimed at ourselves. It is not pleasant to harbour ill feelings and it is not necessary. I believe, for I have frequently demonstrated it, that we can come to entertain kindly feelings for any one if we will try just as hard to find their good qualities as we do the unpleasant things about them Just begin by analyzing your own conscience. Have you any real cause for your dislike, and, if so, is it unpardonable? Who is really to blame, you or he? Persistent friendliness will work wonders and it is infinitely more comfortable to entertain kindly feelings no matter what effort it may cost than it is to cherish ill-will. Everybody has something good about him and for proof of this we have only to look for good."

The Art of Breathing.

If there are few people who give themselves any trouble regarding the quality of the air that they breathe, there are still fewer who bestow any thought on their capacity for utilizing air of any kind after they get it Very few adults retain their normal breathing power, and among women an acquired and most injurious habit of respiration has become so common that it is generally believed to be the natural one, statements to that effect being found even in medical books. Almost all women inflate little more than the upper part of their lungs in respiration, and, in many cases, not the slightest motion can be felt at their waists, whereas, in correct breathing all the motion should be at the waist. This results from the action of the diaphragm, a large flat muscle, which separates the chest from the abdomen, and which, by its rising and falling, alternately enlarges and contracts the chest cavity, thus causing the elastic lung cells to expand and contract. The diaphragm ought to be the principal agent in respiration; but women scarcely use it at all, and how they contrive to get their breath is not easy to see. They certainly do not get enough or nearly enough, and as long as this is so they need never be surprised at any physical ill that may befall them, unless it be a compound fracture, or something of that nature; for no one can possibly be well who does not breath enough. It would be better to try to get along with insufficient food, though that practice is not to be commended either.

It is not at all difficult to learn to breathe correctly. Nature will always assist herself when she can get a chance, and nearly all she wants in this case is not to be interfered with by tight clothing, though a little practice at the same time would not come amiss. The real difficulties of the situation lie in other directions. Women are not conscious of wanting more breath than they get, and if they were, most of them are much averse to doing what will increase the size of their waists.

People may go through life with only a small part of their natural breathing capacity, and never be conscious of their loss; but they will not live so long as if they breathed naturally; they will never have the vitality and endurance that they ought to have; and they will always have to be on their guard against the various diseases which Nature makes use of for the purpose of getting rid of the unfit. They will take cold on the slightest provocation, and, if other circumstances are favourable, may look forward to being carried off at last by consumption or pneumonia, for the unused cells at the bottom of their lungs provide just the kind of soil in which the germs of these diseases thrive.

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(Continued from page 429).

Victorian Notes.

[By G. J. M.]

Re "What is a champion?"—The very fact that is possible to ask such a question suggests that the time has arrived for the Australian pigeon fraternity to provide a permanent answer to the question. This might be done on lines something as follows:—(1) The formation of an Australian Pigeon Federation, a body appointed to systematize and standardize pigeon shows. The societies federated would agree to show under similar rules. The executive to be elected one year from (say) Adelaide fanciers, the next from (say) Melbourne fanciers and so on; (2) Every show under the auspices of a federated society to (a) Be a qualifying show for champions, (b) Provide a champion class; (3) Every bird which has won six first in federated shows to be entitled to compete in a champion class for the title of "champion." (4) The secretaries of shows to enter in the official records (best of all, in the printed catalogues) the ring number, year, &c., of all birds getting first whose owners desire to qualify for championships, and to inscribe these particulars on the prize cards.

As far as I can ascertain Victorian breeders have had a record breeding season. Very few complaints reach me with respect to youngsters failing to hatch after chipping. Perhaps this is due to the fact of our having had a very cool summer.

The Victorian Pigeon Society has virtually decided that young birds shall not be shown as old birds. Readers will remember that at the big exhibition show of 1911 Messrs. Woodward and Mead's magpies were either ignored by the judge or placed after inferior birds. A protest naturally followed, when the judge explained that the birds in question had been penalised for being 1910 birds in old-bird classes. After much deliberation the appeal was dismissed, and the judge's action upheld. The committee consider that the exhibitors acted in good faith as regards the birds, and the latter express themselves as being satisfied.

A Challenge.

Following the little difference of opinion ventilated in these columns as to what constitutes a Champion in Short-faced Tumblers, we have received a letter from Mr. E. A. Grosser. The gist of the communication is, that to settle the question of supremacy as between Mr. Wilkinson and himself, he is willing to put up £2 and a team of 12 Tumblers, 10 being of his own breeding, against a like amount and a similar number of birds put up by Mr. Wilkinson. The scene of the contest to be either the February young bird show or the June show. Mr. Grosser is willing to abide by the decision of any two judges appointed by the Committee of the Society.

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The O.K. Lofts.

Mr. Grosser reports habing had a remarkably good season, Turbits being exceptionally good, the number reared being about fifty. In addition Mr. Grosser has nearly thirty youngsters in each of the following varieties:—Shortface Tumblers, Blondinettes, and African Owls. Mr. Grosser's new lofts, of which he cordially invites inspection, are, he writes, very satisfactory. Each of the six separate lofts being 8ft. by 5ft. and 6ft. with a flight to each measuring 12ft. by 8ft. by 6ft. Amongst recent sales Mr. Grosser has disposed of a fine Black-laced Blondinette to Mr. H. E. Chase, of North Adelaide.

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More Imported Pigeons.

Turbits and Blondinettes from England have recently arrived to the order of a local fancier. We also hear that Mr. F. Nash, of Adelaide, is expecting to shortly receive several turbits from the old country.

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Saddlebacks.

A correspondent writes:—Mr. G. Shee, of Saddleback fame, has won the prize for the greatest number of points for Saddlebacks at the Victorian Pigeon Society Shows. This prize consisting of a beautiful pair of Black Saddles, painted and presented by Mr. Falke, a New Zealand fancier.

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Editorial Notices.

TO ADVERTISERS.—Alteration of advertisements should be in our hands not later than the 15th of the month.

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AGENTS.—Messrs. ATKINSON & CO. and MESSRS. GORDON & GOTCH, Ltd.

The Editor will be pleased to receive correspondence and answer questions. These replies will, for the most part, be sent by mail, unless received just prior to date of publication.

PUBLISHING DATE.—On the 25th of each month preceding title date.

DISCONTINUANCES.—Responsible subscribers will continue to receive this journal until we are notified by letter to discontinue, when all arrears must be paid.

Notes for the Month.

The worst of the hot weather is about over, but the gardener must be prepared to continue artificial watering during the month. Often because the weather is somewhat cool the watering is slackened off, and the amateur is astonished to find his plants flagging, the reason being that during dull days even a large amount of evaporation goes on, and so the soil that has not been replenished with water soon becomes dry, hence the flagging.

We may expect, towards the end of March or the beginning of April, the first of the autumn rains, and as they are the signal for the starting of new gardens, it will, perhaps, not be out of place if I say something about the different kinds of soils and their treatment.

The Choice of Soil for a Garden.—As in nine cases out of ten the garden is attached to or pretty closely connected with the house, and as the taking of a house in a particular locality is generally a matter of necessity, the choice of soil may be said to be that of Hobson, "this or none." If the soil happen, unfortunately, to be of a bad kind, much may be done in the way of improving it. As this is not the place to enter into a long discussion as to the varieties and natures of soils, their chemical constituents, &c., &c., in a general way, all that is necessary to say is that they may be classed under two chief heads, "heavy" and "light," and that, as a rule, the worst to work and treat are to be met with under the first, and the best under the second class; circumstances greatly modifying the nature of any soil under either of these classes.

The worst soil for a garden is a heavy, close, tenacious clay, which is difficult to work and difficult to drain; the best is what is called a "rich loam," this being a fine mixture of the best qualities of thet wo extreme characteristics—the heavy and the light. A fine loam is easily worked, and neither retains the wet too long nor passes it off too quickly; so that in very wet weather it is moderately moist. Soils of all kinds can be greatly improved by proper working, and even the worst soils can be made, if not really good, at least greatly better than when first taken in hand.

First and foremost the soil must be thoroughly moved with fork and hoe. This is not the place to enter into any elaborate statement of the effects of the atmospheric influences upon the soil, but if it were we could show very clearly that a large proportion of the success of the garden arises from having the soil deeply dug and finely pulverised, so that the influences of air and rain may be allowed to exercise freely their important functions. But this is not the only advantage from a deeply stirred and finely pulverised soil; another advantage is that this condition of soil allows the plants to send their roots deep. "Dip deep, the gold lies low," should be the motto of the gardener. The deeper and more open the soil, other conditions being equal, the finer will the plants be, and not only so, but the quicker their arrival at maturity. There is yet another advantage arising from the deep stirring of the soil during the autumn or winter, namely, the raising of its normal temperature, and from it arises the quicker arrival at maturity to which we have already alluded. Ground should be dug evenly a full spade deep. The spade or fork each time it is used should be thoroughly cleaned and wiped perfectly dry with an old dry cloth, and hung up, for it is quite necessary to keep the tools in good working order.

This last remark applies, indeed, to every tool, for it is quite a disgrace, or should be so, for anyone to have his tools in bad working order or lying "littering" about here and there. It shows wretchedly bad management to have to get a tool put in order just at the time it is wanted.

With regard to the hoeing, it may be divided into two kinds, each requiring a separate tool. Hoeing to clear the weeds is done with the onion hoe, or Dutch hoe. This should be done carefully and constantly, but never in wet weather. Let the hoeing be done in time.

"For one year's seeding
Brings seven years' weeding."

Besides taking the nutriment out of the soil which your plants should have every inch of weed is destructive of so much of its virtue. Therefore, ply the hoe freely as soon as weeds appear above ground. The hoe should not be drawn too deeply into the soil, for then some weeds only become partly buried with sufficient earth to nourish their growth, and seeding especially some of the grasses, chickweed, &c. In hoeing it is important to draw the hoe just under the roots of the weeds, and to hoe every inch of the surface.

The second kind of hoeing is for the further stirring of the soil, and for this purpose the fork hoe is best, as the tines can be made to move the soil six or seven inches deep.

When digging the garden in the early autumn, dig in at the same time the requisite amount of manure. The best kind for a flower garden is undoubtedly old rotted cow dung, as there is scarcely any heat with it, and so the young tender roots are not injured. But it is not always possible to get cow dung, and very old short stable manure will make a good substitute.

Beds that are to contain bulbs should not be manured at all, or very little, but they like a certain amount of sand in the soil they are growing in. Towards the end of month put in all early flowering bulbs, such as Crocus, Hyacinth, Tulip, Daffodil, &c.

It will be far better to keep all bulbs in a bed or beds to themselves, as then they can be better looked after, and the roots are not lost when the blooming time is over. The corms of the Ranunculus and Anemone are very easily lost if not carefully marked with a label or planted in a bed by themselves.

The various kinds of Iris can be planted this month. These will make a grand show if planted in groups. The Iris Kaempferi, or Giant Japanese Iris, is a magnificent class, the flowers often measuring four or five inches across, and the colors vary from a heavy black to pure white, with intermediate shades of rose, brown, and crimson.

No garden is complete without the Ixia; their beautiful coloring and graceful habit making them universal favorites. They prefer a sheltered sunny position where the delicate flowers will not be damaged by the high winds. A little sand should be mixed with the soil.

Another bulb seldom seen, but worth cultivating, is the Lachenalia, or Cape Cowslip. Its foliage is prettily spotted, and the flowers are borne on spikes. They are well suited for pot culture. They require an abundance of water.

That charming bulb, Babiana, whose dark green hirsute foliage and showy spikes of brilliant flowers are produced in the utmost profusion (many of them sweetly scented), should be planted this month.

A border of that highly scented bulb, the Freesia, is indispensable now-a-days. It is quite surprising the powers these flowers have of scenting a room, and yet their perfume is not overpowering. Their cultivation is simplicity itself. They can easily be raised from seed, and anyone can multiply his stock of this bulb a thousandfold by careful saving of the seed.

The seed boxes and pans that were carefully prepared last month can now be planted with seed of all hardy annuals and perennials. As recommended last month, plant thinly, as thickly-sown seed can only produce spindly plants.

The following list contains the names of those annuals which can be recommended as having the most useful qualities for an amateur's garden:—Acroclinum, Alyssum, Bartonia, Linaria, Linum, Platystemon, Rhodanthe, Salpiglossis, Scabious, Virginian Stock, Sweet William, Clarkia, Centaurea, Candytuft, Godetia, Eschscholtzia, Lobelia, Ten-week Stock, Mignonette, Gaillardia, Phlox, Whitlavia, Sweet Peas, Schizanthus, Myosotis, Dianthus, Coreopsis, Mimulus, Malope, Leptosyne, Gilia, and Kaulfussia.

In the above list I have tried to give only those annuals that are not only useful in making the flower garden bright, but are good as decorative blooms for the house. A great number are, of course, old favorites, and need no description, such as the Stock, Mignonette, Sweet Pea, Myosotis (Forget-me-Not), &c., &c.

Some of them should be planted in the places where they are to grow, of these are Linum, which does splendidly in masses, Virginian Stock, useful for edging beds; Mignonette, Sweet Peas, and Linaria, a pretty annual growing about eighteen inches high, and having flowers resembling a miniature Snapdragon, and in several colors, the prettiest being a brown and gold variety called Linaria Aparinoides.

The others will do best first sown in a seed box and then pricked out where they are to grow when a suitable size.

The following hardy perennials can also be planted this month. They should be sown in boxes and then pricked out into five-inch pots, about five in each, and when large enough planted out in their position in the border on a suitable day. They are the Antirrhinum or Snapdragon, Aquilegia (Columbine), Carnation, Daisy, Violet, Statice, Wallflower, Pentstemon, Pansy, Polyanthus, Digitalis, Cowslip, Iberis, and Verbena.

The Iberis Gibraltarica or perennial Candytuft is very easily raised from seed, and it very often flowers the first season, but some of the perennials will not flower until the second season when grown from seed.

Put in cuttings of all kinds of Pelargoniums. The best place to strike the cuttings is in a well-constructed propagating house, but as everyone has not such a convenience, they may be successfully propagated in a frame. The best soil is pure loam mixed with silver sand. The side shoots which have not flowered and are not more than two inches long make the best cuttings.

Laurustinus.

A correspondent writes :—It is a small thing, perhaps, but it means a considerable amount of enjoyment through dull, grey months to have in the garden some few plants that carry their flower buds showily and assertively throughout the winter. Such plants are to be secured, and it means a good deal to the flower lover to watch through a long bud-hood, the gradual and beautiful attainment of full maturity, even though that maturity be long delayed. To my mind the bud-hood stage of a plant or shrub is an exceedingly interesting and beautiful one.

It is for this reason that the Laurustinus (Viburnum Tinus) is so welcome an addition to our gardens. We could better spare a more intrinsically beautiful and showy plant—and, indeed, it is beautiful. Look closely into the individual florets, admire the flat, white head of blossom at close quarters, and we realise how wondrously beautiful it is, and in a way we never can in merely passing the shrub. The season has arrived when we may consider the planting of various trees and shrubs, and surely the Laurustinus is well worthy of a place. In a very small garden where space was not to be found for it in the open, I have seen this subject planted against the house wall, and trained to it, and I was especially struck by the height it attained under these conditions. I need scarcely add that when thus used it must enjoy a certain freedom of growth, for to be closely pruned would mean a scant supply of blossom, and this reminds me that very many people prune this as well as other shrubs at the wrong time. It should be done as soon as the flowering is over and not before, as some people do, with the result that the succeeding crop of bloom is greatly impoverished.

— A. K. Williams. —

Reply to "T.I.P." :—This is one of the older roses, for it has been known for the last forty years. Like many of the older favourite roses the petals are extremely numerous, and these spread laterally towards the tip, becoming, therefore, regularly over-lapping, making quite a formal bloom with a flat top, though otherwise good in every respect. The colour is a bright carmine-red, so that when it comes really good, it has a telling effect. The plant is of upright habit, but only of moderate growth, but the bloom itself is of large size when well grown.

The Daffodil

From "The Garden."

The daffodil, says an English writer, is a flower which has become the idol of the few, the admired of many, and the delight of all. That is tantamount to saying that in the hundreds of varieties now catalogued there is enough for all: varieties that will satisfy the most critical and fastidious of Daffodil fanciers; varieties that will satisfy equally those whose tastes or fancies are less exacting; and varieties, still—and their name is legion—that will afford pleasure and delight beyond compare to the cottager or artisan who, untutored in the art, sees and appreciates beauty in every flower that blows.

The Daffodil, more because it is a plant of a bulbous nature than aught else, is almost invariably planted in beds that in early summer will naturally be required for the summer bedding arrangements. That is an initial mistake, so to speak, the obvious outcome of lack of knowledge, and doubly so the failure to appreciate this important fact, viz., that the Daffodil as a permanently-planted subject has a value far greater than any bulbous plant of my acquaintance. Hence to plant it wholly in beds early required for other things, which involves the lifting of the bulbs long before the foliage has matured, is not only an error of a fundamental character, but is so weakening in its after-effects upon the bulbs that the procedure is in large degree responsible for poor displays often seen in borders.

The thing to do in such a case is to arrange matters accordingly, and by working to a prearranged plan, mental or otherwise, ensure the greater success the permenently-planted bulbs afford. The Daffodil takes a longer time to mature than some other bulbous plants: hence a more tender crop should follow it in the beds for a summer display. Then, if in conjunction with such an arrangement a deeper planting were indulged in, placing the bulbs six inches or even eight inches deep in the earth, a light forking up of the surface soil to freshen it for the summer crop would be possible and easy. As a plant to follow the Daffodil the tuberous Begonia has no equal, being easily managed and readily transplanted. For work of this kind, strong growers, such as Sir Watkin, Emperor and Empress, are all valuable, and they may be planted alone or interspersed with ornatus or some of the paler sorts of single incomparabilis. So good a yellow self as Golden Spur and so fine a bi-color as Victoria deserve special mention, and it is doubtful if in decoration the twain could be surpassed.

In moisture or partial shade many daffodils have a value of their own, the varieties whose "cups" or "eyes" are brilliantly coloured being rarely seen in good condition in full sun. In quite moist or even wet soils the popular varieties above named are excellent, and increase in vigour each year. This to the amateur is an important matter, since too often these and similar places are ignored. The varieties of Poeticus, too,, delight in a soil that is constanly cool or uniformly moist, and a greasy clay—a clay of the consistency of a fairly-matured Cheddar chesse—is much more to their liking than it is to the gardener whose duty it is to till it.

PLANTING DAFFODILS IN GRASS.

Through the persistent efforts of a few good gardeners who in the past seemed to see farther ahead than most of their fellows, we, the gardeners of to-day, are reaping the results of what they have sown and the naturalisation of daffodils and other bulbous subjects is now much better understood.

Interesting and beautiful as the Daffodils are when planted in masses in beds and borders, there is a way of utilising these bulbs that is in comparable with the older and more orthdox way of planting this subject.

There are growers who say that unless the turf be broken up before it is replaced over the bulbs, the stronger-growing Daffodils may lift it bodily as they evolve their young, vigorous growth. I am disposed to reply that a great deal depends on the manner in which the actual planting and covering of the bulbs is done. If an unduly thick layer of turf be cut when the preparations for planting are being made, and replaced over the bulbs just as it is, there may be some reason for the statement; but, assuming commonsense will be observed and a thin layer of turf cut in the first instance, and this replaced in proper form and with care, there surely is no reason why the results should not be quite satisfactory.

First of all, I would remind the reader that it is the common practice in some localities to obtain much the same results by more simple means. The turf is never lifted; instead, what is known as a turf punch is used. By the use ol this implement it is possible to make holes that are each large enough to accommodate two or three large bulbs, or half-a-dozen smaller bulbs; but there are few Daffodils so small that it is possible to accommodate so many as six bulbs in one hole; such bulbs would not be much larger than those of ordinary Snowdrops. This turf punch may be used advantageously in meadows where the grass is soft and springy, and where an impression is easily made. Small holes may be cut out to accommodate the required number of bulbs. Cut the series of holes in groups of irregular and natural outline, so that there may be nothing to spoil the picture when the blossoms develop.

DAFFODILS IN POTS.

Daffodils, when grown in pots, do not always bloom in the same sequence which they follow when grown in the open, and these irregularities must be made note of and allowance made in succeeding years. Late varieties, such as Mme. de Graaff, J. B. M. Camm, White Lady and most of the Poets,

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should be potted early, say, the last week in August or the first week in September,, and the plants must be brought into the greenhouse early in January if well-developed blooms and wanted by the middle of March. Early preparation of the late sorts is an absolute necessity, as any attempt at forcing them in a temperature above 60 degrees will only be courting failure, for the flowers will be so small and lacking in substance as to be almost worthless from an exhibition point of view. (The above of course refers to English time.—E.D.)

Now, setting aside flowers for exhibition, I will mention some of the varieties which have proved themselves of especial value as indoor plants. For earliest forcing I would place the old Telamonius plenus, which by early potting and careful forcing may be had in bloom soon after Christmas. This is not a flower admired by all, but it gives a bit of bright yellow and a good bulk of bloom when flowers are scarce. Henry Irving is very early and good, but is not quite as free-flowering as it might be. Golden Spur is the finest of all early yellows, being both early and very floriferous, good bulbs generally averaging two flowers each. Obvallaris is dainty, early and lasting, but is rather on the small side. Maximums, though not very free, is a grand flower, and in this district comes finer as a pot plant than it does in the open. It comes quite early and the flowers have wonderful lasting qualities. Sir Watkin is good and free-flowering, but if forced the least bit too much it comes small and of no substance. It may be stated as an axiom that no short-cupped Daffodil will equal the early trumpet varieties for really early work. Many of them are excellent for March, but if brought on earlier they are small and have but little substance, and it takes a lot of them to fill a vase in house decoration.

Of those coming a little later than those before mentioned, Emperor is a grand variety. There is something really satisfying about a good potful of this noble Daffodil. I always say of Emperor and Mme. de Graaff that, taken all round as garden plants, they have not yet been beaten, though some of the newer varieties on the same lines are undoubtedly more telling on the exhibition table. Glory of Leiden is good as a pot plant, its dwarf sturdy habit and large blooms being two very good points in its favour. The somewhat stiff pose of the flower is not so noticeable when seen growing as it is when one tries to arrange the blooms in vases.

Of the bi-colors I would place Victoria first. It is an ideal pot plant, and shows to much greater advantage than when grown in the open. Horsefieldii is free, but a little lacking in substance. I prefer Empress, though a little later. J. B. M. Camm is very late when grown indoors, but makes a beautiful show of delicate flowers when it does deign to expand them.

Among the short cups, Crown Prince is a great favourite of mine. It has such a clean-cut and bold look with it, while it is also a good lasting flower. Lucifer is very effective, but the bloom is rather weak, and if given a little too much heat goes as limp as a piece of rag. Firebrand is small, but makes such a grand spark of colour that it is well worth sowing.

Of the poets I have not tried to force many varieties. The old ornatus is always fine if good bulbs are used and the forcing is not too severe. Praecox grandiflorus is too small and starry for indoor work. Of the newer ones I think Homer is about the best. It comes flatter and with more substance than any I have tried. Chaucer gives a bit of bright colour, but the flower soon loses form. I hear good accounts of Horace as a forcer, but with me it has not come up to expectations. Blackwell (which ought to have been mentioned among the other red-cupped fraternity) is grand as a pot plant. It is naturally early, of faultless form, and has a very fine orange red cup. By the way, Gloria Mundi is no good at all for inside work.

Among the Leedsii group, Duchess of Westminster is goood, and so are Fairy Queen and White Lady, though the latter is very late. A very cheap one, but by no means to be despised, is Mrs. Langtry. Opened under glass the flowers are very dainty and pretty, and, although of frail appearance, they last a long time. Some of the new Giant Leedsiis are good in pots, but their price is at present prohibitive for this work. I was nearly forgetting Leedsii M. M. de Graaff, which is charming, though late and rather small; but its lovely apricot-tinted cup gives a rare spot of colour which thus early in the year will be much appreciated. Later on, when coloured cups are plentiful, it may be overlooked among its newer rivals. Waterwitch is a very pure and graceful flower, but late. Seagull and Albatross are both good, Seagull being the more lasting flower of the two. Autrocrat is one of the very best of the older incomps., and gives a lovely bit of pure yellow whether grown indoors or in the open. Of the more expensive varieties, Southern Star, Homespun, Circlet, Lord Roberts (grand), Cornelia, Mrs. James H. Veitch and Weardale Perfection are all good. Of the smaller Daffodils, W. P. Milner is excellent. The flowers, which are sulphur colour in the open, come quite white under glass. It makes charming pots, and is also first-rate when grown in fibre in small bowls. Queen of Spain is another dainty little thing, and the flowers last quite an extraordinary long time. Several of the still smaller kinds, such as triandus albus, nanus and cyclamineus, are very dainty and interesting. These tiny ones show to far greater advantage when grown in shallow pans than in the usual deep-sided pots.

These notes have been penned entirely from memory, and I feel sure that many good things have been omitted; but I think sufficient have been named to satisfy most amateur growers. To my mind no bulbous plant is of greater value for growing in pots than the Daffodil; nothing is less trouble, and if the cheaper varieties are employed, nothing is less expensive; while the flowers are always welcome, and now forced by the thousand where they were formerly used by the dozen; but I believe the time to be not far off when they will be employed to a much greater extent than they are even at the present time, and their popularity as greenhouse plants will, no doubt, be much advanced by the annual exhibitions held each March by the Royal Horticultural Society, for when visitors to these

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shows see to what perfection and in what endless variety they may be had in bloom, while those outside are only just showing their foliage, they will surely be stirred up to try their skill at the forcing of Daffodils if they have never previously given it a thought.

HOW TO GROW DAFFODILS IN FIBRE.

It seems strange to think of spring and the Daffodils, which are its attendants, when we are rejoicing in the wealth of midsummer bloom; but it is only by so doing that we can hope to meet with the fullest measure of success. All bulbs need a long period of growth, and the more roots there are formed, the finer will be the flowers that are produced. Then, again, if bulbs are kept a long time out of the ground they are apt to become dry, and so deteriorate. I always endeavour to begin potting some bulbs as early as I can procure them, from the middle of August onwards, and the main batch are put in about the first or second week in September. If any are needed for a later display, it is better to put them in almost as early as the others, and retard them when they have begun to shoot by keeping them in as cold a place as possible.

Daffodils can be grown in any kind of receptacle, from the expensive china bowl to the ordinary jam pot; and as bulbs can be bought now so cheaply, it is a pleasure that is within the reach of the humblest gardener. I prefer the blue and white china bowls, which cost from about 6d. for the smaller sizes, increasing the price for the larger ones, or the plain green vases; but I often grow mine in plain glass jam jars, as it is so interesting to watch the development of the roots. Later on the jar can be placed in a fancy pot, or the contents bodily transferred to another one.

In my humble opinion, one of the chief essentials to success in growing bulbs in this way is the provision of good drainage. When we grow plants of any kind in ordinary flower pots, the surplus water is able to drain away through the the holes; but even then we place crocks and other material to ensure that the soil does not become sodden. As there is no outlet for the water in the china pot, I always provide a layer of small lumps of charcoal at the bottom, so that any surplus water collects there and the peat or fibre does not become sodden and so cause the bulb to rot; the charcoal also serves to keep the water sweet. Daffodils are moisture-loving plants and when they are growing require a good supply, but they must not be given too much until the roots are well formed and able to absorb it. The materials required, then, are charcoal, peat-moss fibre or Coacoanut fibre and oyster shell.

The method of planting is as follows:—Get a large receptacle or pan in which the fibre and shell can be thoroughly mixed, allowing about 6lb. or 7lb. of oyster shell to a bushel of fibre, and mix it well with the hands, rubbing it so that no lumps are left. Then add water by degrees, turning it over until the whole is thoroughly moistened, so that when it is squeezed in the hand no surplus water runs out. Then take the bowl, place therein a layer of charcoal, and then the moistened fibre to about half the depth of the pot; then place the bulbs on this, gently pressing them down and putting them so that they do not touch one another. Fill up all the intervening spaces, just pushing the fibre down with the finger, and cover the bulbs to within half an inch of the top of the bowl, but do not press the fibre hard or make it very firm, or the roots when growing will push the bulb out of the pot. When the bulbs are potted they need no further attention for a fortnight or three weeks, and then just examine them at intervals of a few days to see that the fibre does not become dry. If it should become too dry at the top, water them carefully, and if they seem too moist turn the pots on their sides to drain away any superfluous water. If the weather is warm and dry they will need more frequent watering; but if it is damp or frosty they do not need so much, and in times of severe frost it is best to keep them on the dry side, as then they are not so apt to get frozen.

I do not find it necessary to keep the bowls in the dark, and on no account must they be kept in a close, confined cupboard. I place mine on shelves in a disused room at the top of the house, where they are shaded from the direct light, until they are well rooted; then when the shoots being to appear they are gradually put into the light and brought on in batches by being grown in a sunny windows close to the glass, so that they do not become tall and drawn. If the weather is cold and frosty, take them away from the window at night, or place newspapers between them and the glass; the worst that can happen is for them to be retarded a little. I believe that when they are well rooted and the foliage well up they can be gently forced by putting them into slight heat; but I find that unless great care is taken they are liable to go "blind." I have grown Daffodils, Narcissi and many other kinds of bulbs in this way for more than ten years, and I have hardly ever had a failure.

Nearly all kinds of Daffodils and Narcissi can be grown in this way; but I will give the names of some that I know by experience will give giid results. The Paper-White Narcissus and other Polyanthus Narcissi are French, Monarque and Mont Cenis. Of Daffodils (trumpet varieties) the earliest are Obvallaris and Golden Spur, both of which do well; other later ones are princeps (one of the most moderate in price), Emperor, Empress, Victoria, and J. B. M. Camm. Of the Leedsii section I can recommend M. Magdalene de Graaff and Mrs. Langtry, the latter especially, as it is very floriferous and always does well. In the Barrii section, Barrii conspicuous heads the list, both as to size and price, and others are Leonie and Sir Watkin. The Poeticus also always do well, and some of the cheaper varieties are ornatus, Poetarum and Almira, and also the newer Poetaz hybrids, such as Alsace, Elvira and Irene.

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The Rockery.

A rockery is not merely a collection of rocks planted on a mound and suggestive of a dog cemetery, but rather a question of providing a suitable home for rare, and otherwise, alpines and rock plants. It must be serviceable as well as ornamental. The most important feature is the construction of congenial homes suitable for the requirements of each species. Winding walks, mounds and dells can be formed and with the addition of a running stream, shallow ponds can be constructed and made suitable for bog and aquatic plants and yet present a natural appearance. Nothing affords greater scope for the exercise of taste and ingenuity than the designing and planting of a rockery. Though large rocks present a massive appearance small ones are preferable, as they can be handled with ease and can be taken up and replaced at will. As each individual pocket is made the soil in the pocket must be level, not sloping as is sometimes the case, so that each pocket will retain all the moisture that comes to it.

Rock plants are so varied in regard to soil that ordinary garden soil rarely succeeds. A suitable mixture must be provided for them such as fibrous loam, peat, leaf soil and mortar rubbish; this will be found to suit most of the alpine plants.

When planting a rockery grouping will give much better effect than planting single plants at intervals and slow-grawing plants must not on any account be planted with the more rapid-growing varieties or the result would be over-crowding. Often the most valuable alpines are destroyed in this way. When immediate effect is wanted the best method is to secure good sized plants from a reliable nurseryman, though the most interesting part of this pursuit is the raising of a collection from seed. Some of the species germinate quickly; others may be from six to twelve months, consequently there ought to be no hasty decision in turning out the pots in which the seed have been sown.—"Horticulture."

Points on Carnation Breeding.

Read before a meeting of the American Carnation Society.

Though I have devoted considerable time to the breeding of carnations and to the study of them during the past fourteen years, in view of the complexity of the subject and my lack of scientific knowledge, I feel diffident in placing my views before a conference composed of the most advanced scientific talent of the world. I shall not attempt to enter into a scientific discussion of the subject, but will endeavor to state in plain language what seems to me to have been thus far accomplished.

— The Original Carnation. —

As most florists know, the original carnation, which has been known in history for several centuries before the Christian era, was a five-petaled single bloom one inch in diameter and of a pinkish-mauve color. It was distributed in its wild state over the whole southern half of the temperate zone in Europe, but was known more particularly to historians as inhabiting France and Northern Italy. It was found in abundance in Normandy, from whence it is generally believed to have been introduced into Great Britain about the time of the Norman Conquest. Even so recently as 1874 it was found in a wild state covering the Castle of Fallaise, in which William the Conquerer was born. It was described by Theophrastus as early as 300 B. C., and has been frequently mentioned in history since that date.

— Methods of Reproduction. —

The carnation of today, the subject upon which I am working, is the product of several centuries of hybridisation and culture. It is an open-pollinated species, and mother plants can be chosen from amongst hybrids, as well as by inbreeding upon the same plant or upon plants of the same variety. A variety once produced from seed is easily perpetuated for a certain period by propagation from cuttings which are easily rooted and usually secured in abundance. Improvements in varieties may be made by bud selection and new varieties are sometimes secured by bud variation (sports), as well as from seed variation and by hybridisation.

In raising varieties from hybridised seed very few improvements are produced, the proportion being one good variety for every thousand hybrids grown, and probably as little as one decided advance in each five or ten thousand hybrids grown; and unless some law is discovered whereby we can forecast more surely than we now can what certain specified hybrid seed will produce, it would seem as if even this low proportion of valuable new varieties would decrease rather than increase in view of the higher standard which is being demanded from year to year.

— Working for Color Improvement. —

Up to the present time I have been pursuing my studies in breeding upon the single subject of color alone, basing my work upon the theory that any laws developed in color would hold good when applied to the development of other qualities; and this hypothesis I still believe to be correct.

The tools used are very simple, consisting only of a pair of delicate tweezers and a microscopic magnifying glass. I used to employ a fine camel's hair brush for transferring the pollen but eventually abandoned it, as I found the use of the tweezers less difficult and speedier work could be done than with the brushes.

In hybridising the carnation the first step is to remove all the anthers from the mother flower before they develop, and to watch the pistil till it is in a proper receptive condition. The anthers of the selected male parent are watched until just bursting, and the pollen is in the condition of a dry powder. The anther is then removed by means of the tweezers and the pistil of the mother flower is fertilized by lightly touching it along its entire length with the pollen-bearing anther. Conception generally takes place within twenty-four hours after this operation, provided the conditions are favorable.

In order to pursue my colors studies with reasonable method I have di-

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vided the work into the following sections :

1. Fancy section, comprising all varieties peculiarly marked, of various colors.

2. Purple and blue 'section, comprising all purple flowers and any which may show a tendency towards blue in color.

3. Crimson and maroon section, comprising all shades of crimson, maroon or scarlet maroon.

4. Scarlet section, comprising all shades of red and scarlet.

5. Light pink section, including all shades of salmon, flesh or daybreak tints.

6. Dark pink section, including all rose, cherry and deep pink tones.

7. White section.

8. Yellow variegated section, including all varieties having a yellow ground with scarlet, crimson or pink markings. I have not as yet been able to establish a pure yellow section, for even though the seeding plant may give pure yellow flowers for a time, as soon as propagation is carried on to any extent, more or less variegation appears.

9. White variegated section, comprising all varieties with white grounds marked with various colors.

10. Pink variegated section, comprising all varieties having a pink ground of any shade with markings in deeper colors.

In the purple and blue section I have not as yet succeded in producing anything that might be termed a blue ; for, although we have had several varieties showing a distinct blue shade, there has invariably been enough pink in it to convert the tone into a purple or a mauve. The crimson, dark and light pink, scarlet and white sections have been fairly well fixed ; but the yellow, white and pink variegated, and blue sections will be very difficult to fix, as they are essentially mosaics, and there is a constant tendency towards variation in all their progeny.

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Wistaria Chinensis.

This well-known hardy climber is a native of China. It is well known to be one of the finest plants for covering walls, cottages, affording shade to balconies, or covering trunks of trees or other bare spaces. In suburban gardens these plants are always objects of interest and beauty, the sweetly - scented, lavender - coloured racemes being very decorative.

The Wistaria will thrive in any ordinary garden soil, if well-drained. If it is naturally a light sand, the addition of loam would be beneficial. On the contrary if the soil is of a stiff, tenacious character, mix with it some leaf mould or wood ashes, and, if possible, a little mortar rubbish to make it of a freer nature. In this compost the Wistaria will grow amazingly, and when once well established will need no further attention in the matter of soils.

This plant flowers both on spurs and the long shoots of the previous year's growth ; consequently, both systems of pruning adopted in the case of Vines, viz., spur and long rod pruning, are practised, and, in some instances, are found combined on the same plant. In the event of spur pruning being adopted all shoots except extension ones—on the leading stems should be pinched back after flowering to within one foot of the main stem, in order to check the rampant growth. These shoots will again break into growth and after growing a few inches in length should be stopped in the same way. The result will be the formation of flower spurs at the foot of the shoot first shortened. When pruned, these must be cut back to within five or six eyes of the main stem ; the resultant shoots from these eyes are to be treated in the same way as those of the previous year, and so on, year after year. The other system of retaining the long shoots also gives a wealth of flowers. When grown in bush form very shapely plants can be grown by systematic spur pruning. S. H.

◆

Annual Nasturtiums.

The annual Nasturtium, or Tropæolum majus, as the botanists call it, is regarded by many as a common subject to be relegated to some obscure portion of the garden, or not worthy of a place at all. Why this should be so is hard to conceive, unless it is that its easy culture makes but little demand on the intelligence of the cultivator. With a little care in the selection of varieties and site for the plants there is hardly another annual that will give such a brilliant display of flowers for so little outlay of money and time.

The plants are represented by two distinct sections, viz., the Tom Thumb, or dwarf, and the climbing. The former are excellent for filling beds and blank spaces towards the fronts of borders, while the latter are admirably adapted for climbing over trellis work, wire netting, unsightly hedges, over clumps of pea sticks in the border, or as a trailing or climbing subject for window boxes. The culture of both types is the same. For all ordinary purposes the seeds are best sown where the plants are to flower.

As regards soil, the one thing to specially avoid is heavy manuring. If this is resorted to, enormous stems and leaves will be produced at the expense of flowers; also very light and dry soil should be avoided. The plants will grow in such soil, but their flowering period is considerably curtailed. With these two exceptions, the plants will thrive in any soil that is likely to be encountered in gardens. For filling beds sow the Tom Thumb varieties 9 inches apart each way, placing two seeds in each hole and allowing the two seedlings to remain and grow together. The reason for this is that when the plants flower there may be one or two not true to colour, and these can then be removed without making a gap in the bed. Two inches is a good depth to sow; the climbing varieties should be sown 1 foot each way.

After-culture will consist in keeping down all weeds, supplying abundance of water during dry weather, and, above, everything else, picking off the seeds as soon as the flowers have fallen. The seeds make an excellent substitute for Capsicums if placed in vinegar as gathered. If the above instructions are persistently carried out, these plants will provide a glorious display of flowers. There are any number of named varieties which could be recommended, the difficulty would be to choose the best where all are so good. Even sixpen'orth of mixed holds a heap of beauty.

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The Heucheras.

It does well in ordinary garden soil, and should not be too parched up in summer, otherwise it is easy enough to grow. Time has not stood still with this slender graceful perennial. The hybrider's art has been requisitioned and Heuchera sanguinea hybrida is a great improvement upon the older form. H. S. maxima is also an excellent strain. It makes a good border plant, but it is never quite so well displayed as when seen growing in the rock garden or on a raised edging.

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The Cultivation of Amaryllis.

Why is it these beautiful flowers are so seldom seen?

Their cultivation is very easy. When the foliage is turning brown and water should be gradually withheld until it dies down altogether, then the bulbs should be stored away in a dry place, keeping them in their pots. In spring they should be examined, and those that have occupied the same pots for two seasons should be repotted, a six-inch pot being big enough as a rule for the largest bulbs. They do well in a mixture of three parts loam and one part leaf-soil, with a small amount of charcoal and silver sand added. Shake the soil from the old bulbs very carefully, and break off all bulbets, remove all decayed roots and pot firmly. The bulb should be buried about three parts its depth. They will require very little water until the leaves are getting well up.

For general purposes it is perhaps the best thing to buy bulbs ready for flowering, but where one has the convenience it is very interesting to raise them from seed. These are usually sown in the spring in a brisk heat, sowing the seeds about one inch apart in pans filled with light soil and well drained. As soon as they are a few inches high they must be potted off into small pots and kept shifted on as occasion demands, but on no account must they be over-potted. These seedlings should never be dried off until they are large enough to flower, which is from two or three years—a long time to wait, but the cultivator is well rewarded, as once they reach the flowering stage, they will last for years with proper treatment, and then there is always the possibility of a real gem appearing among them if the seed has been obtained from a good source.

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LADY IN ATTENDANCE.

The Chianodoxes.

This interesting little bulbous plant, sometimes called Glory of the Snow, is one of the earliest of the spring flowering bulbs. They grow readily from seed sown in the early autumn and multiply quickly when once established. They are quite dwarf in growth and make a pretty covering for a bed of tall growing crimson tulips. The rich beauty of the latter gains by contrast with the more modest blue and white colouring of the smaller bulbs or planted in broad belts in a shaded position; they make an interesting feature in any garden. They should be sown in autumn and need just ordinary care. When big enough to handle prick out into box or bed three inches apart and later on transfer to flowering quarters where they should be set six to nine inches apart, that is for the dwarf varieties. At this distance they will make an even carpet of foliage and bloom. The colour of the type is yellow. The variety macrocarpa is very dwarf and of trailing habit, the flowers being very abundant and of good size.

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The Evening Primrose.

Anyone whose opportunities for enjoying the pleasures of his garden are confined to the evenings should extend a warm welcome to such plants as open their blossoms and display their charms at the close of the day. The Oenotheras or Evening Primroses are one of these, for although a good many of them do unfold their blossoms during the day, it is in the evening that the flowers are most fully expanded. There are both annual and perennial varieties, mostly dwarf growing. Planted in masses, they make a very interesting addition to the garden.

⁂

Zephyranthes.

Zephranthes is a fanciful name derived from Zephyros, the west wind, and anthe, a flower. In England, where it is largely grown some of its names are Fairy Lily, Lily of the Virgin, Flower of the West Wind, Zephyr Flower, and Atamasco Lily. The genus is said to contain over thirty known species, of which all but one (from Western Tropical Africa) are natives of America, from Virginia, New Mexico and Arizona to South Chili. The bulbs are small, as compared to most Amaryllids, to which family they belong. The leaves are few and grass-like, appearing with or after the flowers, and the latter are always solitary (one to the scape) and either pink, white, purplish or yellow, though sometimes various-coloured in the same species.

They do their growing and blooming during the summer months, resting in winter, and may be grown either in pots or the open ground. In pot culture, plant three or four bulbs in a 5 or 6 inch pot of good sandy soil, merely covering the bulbs, and late in the autumn let the soil go nearly dry, when they may be stored in a cellar, if not too damp and dark, but do not let the soil dry out completely.

Another very pleasing way is to plant the bulbs round the edges of large pots or tubs containing pot shrubs or any large growing plants and leave them there until they increase so as to need dividing. The roots of the large plants will keep the soil sweet and the Zephyranthes bulbs will take care of themselves, blooming at intervals, and often when least expected. In the open ground, plant out either in clumps or borders.

Z. Atamasco, the Atamasco Lily, flowers white crocus like in form, changing to light pink on stems a foot high, is the best known in this country. Other varieties are Z. candida, the Peruvian Swamp Lily, flowers white, but very distinct from the above, leaves fleshy and rush-like and the bulbs multiply rapidly. Z. texana is a dainty little species from Southern Texas, and Z. carinata, a native of Cuba, Jamaica, Mexico and Gautamala, of which the flowers are a clear rosy pink, produced throughout the summer. Bulbs of Z. atamasco are procurable at a very cheap rate.

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The Summer Cypress.

— Kochia Trichophila. —

This highly attractive annual, which, when fully developed, attains a height of 3 feet, grows in a pyramidal form like a Cypress, hence the common name.

It has long narrow leaves borne on slender branches giving the plant a distinctly graceful appearance; but its chief value lies in the fact that stem branches and leaves colour up in the autumn into what has been described by some as a russet-crimson; each plant becomes a veritable "burning bush."

It should be sown in early spring, where heat is available; July will be better, for the plant takes some while to colour up and come to perfection. In due course the seedlings should be pricked out and potted singly in small pots and afterwards transferred to permanent quarters.

Lilium Longiflorum.

Of all the Lilies, few surpass in beauty L. Longiflorum and its varieties. It is capable of being grown in many ways, and may readily be put to use in house decoration for it is an excellant pot plant.

Although this Lily stands the sun well in the open, it is grown to the best advantage where there is some shade in the middle of the day; an ideal position would be in a bed of dwarf shrubs, with a carpet of some of the smaller growing annuals. It should be noted that, though ordinary garden soil will grow good lilies of this sort. Better and bigger blooms result from preparing the bed by deep digging and the addition of leaf mould, sand and very old manure to the bed.

In planting, carefully examine the bulbs and cut out any decayed or bruised parts, dust with sulphur, and fill in the scales with sand. The depth to plant is important, as some Lilies produce roots at the base of the stem above the bulbs, while others only produce roots below the bulb. It is thus obvious that the stem-rooting kinds require to be planted deeper than the others, and L. longiflorum being stem-rooted, will require a depth of six inches. Some rich soil should be placed over the bulbs, which later on will form the medium from which the stem roots will draw their nourishment.

When they have finished flowering, do not cut down the stems, for there is nothing injures the bulbs more, but let them die down naturally, till they are ready for lifting. Lft them and place them in boxes of cocoanut fibre or sand and store them away in a nice dry shed.

Pergola.

Reply to "P."—Pergola is the Italian word which expresses a kind of open colonnade of rough pillars, built of any material that comes to hand, over which vines are trained. A variety of grape called Pergolese is much grown in some districts in Italy, from which, in all probability, the pergola, or vine arbour, has derived its name. Its use is not confined to grape culture, as it is a frequent addition to Italian gardens, forming a shaded walk or resting place in summer heat. Of late years this form of garden adornment has found great favour in England, and is growning in popularity with us for it may make a very charming feature when well carried out and where the surroundings are in accord, but it is not suitable for every position. The construction ought to be somewhat massive to give the true effect, and is thus most suitable for gardens of some extent.

Gypsophila Paniculata.

Those not knowing the habits can hardly imagine the beauty of these gypsophilias if left standing year after year (they can be left on one spot indefinitely) one plant often sending up spikes that together will measure 4 to 5 feet in diameter and 2½ to 3 feet high. The individual flowers are white and very small, but the great quantity of flower is what makes the plant so attractive and useful.

It is very hardy, and I know of no perennial that has a better habit, staying as it does in the exact spot where it is planted and never running underground. It is an ideal plant to mix in with other early-flowering perennials, whosé foliage becomes yellow and unattractive.

Although the broken up spike can be used to advantage in many ways, it is for large vase work, with the natural spike cut to the ground, that the Gypsophila paniculata and its beautiful double form are most useful.

When planting, plant deeply, as the following season's crowns are frequently made on the stem of the year preceding. The roots go down a great depth, which enables them to stand the driest of seasons, without in any way impairing their beauty. The description of the double form is in every way the same; the flowers are well formed, of good substance, and are about three times as large as the single, and with their extra quantity of petals, show a purer whiteness.

Avoid Monotony in the Garden.

I believe in avoiding a too great sameness and monotony in the garden, and in order to do this I would plead, and that very earnestly, that we do not, when the division and overhauling of the plants of a border takes place, plant the surplus in some other border. That plan often means a mere duplicate of the former, and is a distinctly bad, weak plan to work on. No, if we find that in one border there is ample material to plant and stock another, let us take a list of the plants that we may divide, and instead of taking portions of all and sundry let us devote certain subjects exclusively for one border, and others for the one that is to be stocked, and in this way get different plants for each.

I know that we are sometimes told that we should be satisfied with one group only of a subject in a border, but this does not satisfy me, and I would far rather duplicate a plant or group of plants over and over in a border than distribute them all over the garden in every bed or border in which space could be found.—I.P.

◆

No one is so accursed by fate,
No one so utterly desolate,
But some heart, though unknown,
Responds unto its own;
Responds, as if with unseen wings
An angel touched its quivering strings,
And whispering in its song,
Where hast thou stayed so long?

—Longfellow.

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The Orchard.

Fruit Exportation.

—Victorian Grape Shipments.—

According to "The Australasian" the prospect of securing space in several of the oversea boats for the shipment of grapes to the United Kingdom this year is good. At this stage there is no likelihood of a recurrence of last season's disappointments, when several experimental consignments, after arrival in Melbourne, had to be withdrawn, owing to the lack of accommodation on outward-bound vessels. Concerning this trade, Mr. Castella, the viticultural expert, has made an excellent suggestion. With a view to developing this branch of the industry, and to gaining experience in the handling of the berries for export, he suggests that growers should make combined shipments. If, for instance, 10 or 20 growers in each district were to provide a score of cases, a combined consignment of from 200 to 400 cases could be exported in the one boat. By this means the fruit would have a better chance of being properly looked after as regards temperatures, and, in the event of losses occurring, the share each grower would have to take would be correspondingly reduced in accordance with the quantity of fruit exported. A matter of 20 or 40 cases spread over several shipments would not be, in the event of complete failure, a great financial loss, while, at the same time, the experience gained would be of immense advantage. But there is no need to anticipate failure. The view is taken merely to emphasise the smallness of any possible losses to anyone taking part in a co-operative consignment. At the outset it could scarcely exceed £10, while, as is the more probable, should the berries arrive in good condition, they may be expected to realise from 15/ to 30/ a case. There is need that growers who have planted export varieties of grapes, such as Oabanez, Flame Tokay, and Purple Cornichon, should gain some experience in preparing this class of fruit for shipment, for in a few years they will have to handle fairly large quantities.

—Preparation of Berries.—

The chief variety of grape now available for export is the Doradilla. Mr. Castella believes that, providing ordinary care is taken in its preparation for export, it will arrive in London in fairly good condition, and leave a margin of profit to shippers. Grapes require different and more careful treatment than most other fruits, but South and West Australian shipments have shown that shippers are well recompensed for such extra attention as is required. They should be gathered a day prior to packing, so as to enable the berries to toughen, and all loose and decayed berries should be removed. It is customary to go over grapes when packing for the ordinary market, but, in view of the fact that decay invariably sets in when the berries become separated from the bunches, greater care is necessary to see that all are firmly secured. Approximately 5 ℔ of granulated cork are required to properly pack a case, the main object being to thoroughly cover the fruit. This is accomplished by putting in a layer of cork at the bottom of the case a couple of inches deep, after which the bunches are carefully packed, more cork being used to fill up the interstics between the berries and bunches. When the fruit is in position the cork is carefully shaken into position, and eventually a good covering is put in on top to protect the fruit. In a well packed case no fruit should be in evidence when the lid is removed. For export purposed 28 ℔. of fruit should be packed in each package. It is also advisable that consignments for shipment should reach Melbourne a day or two before the vessel leaves, so that the fruit may be kept in a cool place, where it is allowed to wilt before being placed on board. The toughening of the fruit prior to packing and subsequent gradual wilting are of importance in improving the carrying condition of the berries.

Fruit Transport.

It is acknowledged that the facilities provided by the railways for the transit of fruit to the seaboard are many years behind the times. Arrangements for the carriage of fruit are of the most primitive kind, for frequently not even louvre trucks are available for the purpose. Many consignments to the English market have been doomed to failure, even before they left Victoria, simply because of the sweating the fruit had undergone in tarpaulin-covered trucks in transit. Consequently, in discussing this phase of the export trade, it seems much like putting the cart before the horse to suggest improvements before existing disadvantages are rectified. Nevertheless the development of the fruit-growing industry clearly indicates that that stage has been reached when a vigorous, progressive policy on the part of the Railway Commissioners is necessary to enable development to be maintained. The adoption of refrigerated trucks for the safe carriage of fruit over long distances should be no longer delayed. On some lines they cannot be done without, save at the expense sustained by growers, owing to the damage done to fruit. These cars are necessary on all long-distance journeys where fruit has to be conveyed to the seaboard for exportations. Mildura growers, for instance, are entirely debarred from taking part in the export pear trade. Very large quantities of Williams pears are grown on the settlement, but if picked in the proper condition required for export the fruit, by the time it reaches the boat, is practically unfit for the purpose. No matter how complete arrangements may be on board ship for the conveyance of this fruit, it cannot be successfully carried in a semi-ripe condition. This variety of pear will turn from green to yellow in two days, the length of time occupied in its transit from Mildura orchards to the boat, consequently the chances of successful shipment under existing conditions are extremely remote. Precooling must, in the course of a few years, play a principal part in the preparation of pears for export, and it would be to advantage if the cooling process was extended to other fruits. The Victorian Railway Commissioners need to imitate American methods concerning the cool carriage of fruit, and they could

ith advantage carry out experi-
ental work in this direction on
ome of the long listance lines.

An unbroken continuity of con-
gnments is probably as impor-
ant a factor in the development
an oversea trade in pears and
ther soft fruits as is the actual
uality of fruit consigned. Many
rowers are prone to overlook
eir obligations in this respect,
nd instead of sending away fruit
gularly they allow the condi-
ons of the local markets to
overn the destination of their
onsignments. Last year the
upment of Williams' Pears was
marked success, and agents on
e English markets have since
ooked forward to a continuance
f this particular trade. Arrange-
ents had been made to send
way two shipments of pears this
ason, but owing to the lightness
f the yield the first had to be
ancelled. Now there is just the
sk that the second consignment
ill be sent away without its full
omplement, for, in view of the
kelihood of remunerative local
arkets, there is a tendecy on the
art of some growers to recede
om their obligations. The im-
ortance of regularly supplying
e English market is not being
verlooked by South African ex-
orters, who are fast building up
lucrative trade. They have
cognised that to ensure con-
ant trade relations suppliers
ust make every effort to fulfil
e demands of agents. When
his condition has been reached
e business man is able to enter
ito arrangements with the con-
iction that he can supply what
e promises, and his interests
aturally lead him to look to
roducers who can be depended
pon to fill their engagements.
ast year some peaches from
outh Africa sold in London at
/ each. There is now a move-
ent on foot to send away con-
ignments of plums and peaches,
s well as pears. Growers, how-
ver, should not state their inten-
ion to participate in these con-
ignments unless there is some
kelihood of fulfilment. It is
umoured that great difficulty
ill be encountered in securing
he desired quantity for the pear
hipment, though there should be
o trouble whatever in this re-
pect if growers stand by their
xpressed intentions of some
onths ago.

Raisin Drying.

The best grapes for raisins are Muscatels, but Raisin des Dames and Madresfield Court Black Muscats and Malagas make good raisins for home use. The grapes should on no account be cut until perfectly ripe. If possible, they should hang until the ripest on the bunches begin to dry. In the cooler districts it is better not to make raisins at all, for the grapes are usually too deficient in sugar to make a first-class raisin. The appearance may be all right, but the quality is not so good as those made in the hotter districts.

For table raisins or "layers" the finest bunches only should be taken, and all defective and small grapes should be cut off with pointed scissors, the bunch being held by the stalk, so that the bloom will not be rubbed off. The bunches should be laid carefully on the trays with the best side up. The trays should have cleats to keep the tray two inches off the ground. This will facilitate the drying. In hot weather the raisins may dry in about seven days, but it is advisable to take longer, say, 12 days. When they are about three-quarters dry, or say, in seven or eight days—these figures are only approximate, as all depends on locality and weather—they are carefully turned by placing an empty tray on top, and deftly turning both over, leaving the fruit on the new tray, and the old one empty for turning the next. They must not be allowed to become too dry. When ready, they are packed tray above tray to await sorting. This should be done early in the morning, when the stems are slightly moist and flexible. Some berries will be found too dry, and some hardly dry enough, and to equalise them they are placed in boxes slightly larger than the tray, and about 18 in. deep. These are called sweat boxes. Stout, glazed Manilla or brown paper is placed at the bottom, and at intervals, as the layers of raisins are filled in, to prevent the tangling of the stems and the breaking of the bunches. As they are being put in the sweat boxes they are sorted into two or three grades, and each bunch is handled separately by the stem, so as not to rub off the bloom of the fruit.

To ascertain if a raisin is fully dry, take it between the thumb and finger, and roll it gently until softened, when either jelly or water will exude. If jelly, it is dry; if water, it requires further drying. The raisins remain in the sweat boxes, packed one above another, in a cool, dark room, from ten to twenty days. The fruit is then ready for packing in neat, clean wood boxes, holding 7 or 14 lb., with fancy paper.

Unless Muscatel grapes are of an exceptionally large and even size, it is not wise to attempt to make "layers." They take a lot of time and trouble, and unless they are really fine and good do not pay.

Loose or pudding raisins are prepared much more rapidly. The grapes are picked in baskets or boxes, and brought to the drying ground, where they are placed on a wire tray and dipped for, from 10 to 20 seconds, into a shallow tank of boiling lye-water, made by adding about one pound of carbonate of potash to three gallons of water, or 1 lb. of Greenbank's concentrated lye (caustic soda, 98 per cent. strength) in 15 gallons of water kept at a temperature of about 180 deg. Fah. After being dipped in lye, the object of which is to break the skin and facilitate drying, the fruit is plunged for an instant into clean water, to remove the soda or potash, and are then spread on the trays and arranged on the drying ground. They dry more quickly, and do not require the same care. As soon as sufficiently dry, and while the stalks are brittle, the raisins are rubbed off and put through the winnower; or, if possible, the dry fruit is put through a special machine called a stemmer and grader. The loose raisins are placed in large boxes to equalise, and are then packed in clean deal boxes, containing either 28 or 56 lb.

Trays.—These should be of wood. Those who have to procure a supply will do best to suit their own ideas, 6 x 3 and 4½ x 2½, have been found convenient by some. In California there is as much divergence of opinion as here, but, probably, there are as many 3 x 2 feet as all the rest put together. They are most easily made of three pieces 6 x ⅜ in. pine or spruce, or four pieces 6 x ⅜ in., 3 ft. long, held together by a cleat across each end 2 ft. long, made of 2 x 1 in. deal or pine. The cleats are nailed close to the ends by the thinner edge, so that if the trays are packed one above another there is a distance of two inches between each pair. These trays can be handled by one man if necessary. They will hold about 20 lb. of fruit, which will produce in the dryer districts about 6 or 7 lb. of raisins. For home use any convenient substitute for trays may be used.

Bees and Spraying.

The question whether or no the poisonous compounds used in spraying fruit trees have any harmful effect on bees is one which has been much discussed in publications devoted to fruit growing and to bee keeping, without, however, any very certain knowledge being arrived at. Nevertheless, many beekeepers hold very decided views on the subject and maintain that the practice of spraying trees in bloom is disastrous to their industry, and is, moreover a suicidal policy on the part of fruit growers. They appear to have, to some extent at all events proved their case, for in sections of the United States, and we believe also in Canada, spraying with poisonous compounds during full blooming period has been declared a punishable offence. Orchardists, as a rule, regard the matter with some amount of indifference, for the reason, probably that it is usually some other fellows bees which pay any penalty which may follow. In the January issue of the Victorian Journal of Agriculture Mr. E. E. Prescott of the Burnley Horticultural school, and Mr. F. E. Buhne. State Bee Expert, place on record some interesting observations on the subject. Results to date may not be conclusive but they are certainly helpful and reassuring both to the apiarist and fruit grower. They write :—

"The establishment of an apiary at the Burnley Horticultural Gardens has furnish an opportunity for observing and recording data regarding the working of bees among fruit trees, and the effect of the various orchard operations upon the bees. The apiary was established during the spring of last year; and, although it is too early to establish any definite conclusion, certain observations have already been made which may somewhat upset various theories regarding the action of sprays upon the bees.

It is an accepted fact that the bee is the most useful of all insects for the purposes of conveying pollen from flower to flower for fertilization purposes. It was pointed out last year, in the January and April numbers of the Journal, that bees were of great service to the orchardist in assisting to increase the yield of fruit. It is also known that to exclude bees and other insects from the trees at the time when they are in blossom is sure to result in a considerably reduced fruit crop.

It is often considered that bees are able to collect a good store of honey from fruit tree blossom, and that the yield of fruit tree honey comes at a time when the bees urgently need it for brood rearing. That may be so in other countries, but it does not appear to be so in Australia. Here the nectar flow seems to be somewhat weak, and insufficient in quantity for the necessities of the bees A Victorian apiarist during the past season removed his bee colonies from his home to a district where the bees had an available range over 15,000 fruit trees. He ultimately found that the bees were starving, and he had to remove them to a more suitable locality. It may thus be found that the chief use of bees in the orchard will be for cross-fertilization purposes.

It has been frequently stated, especially in publications dealing exclusively with the honey bee, that spraying the fruit trees, at the time when the trees are in blossom, will cause great mortality amongst the bee colonies, particularly if the spray be a poisonous one.

Whenever losses of bees occur in apiaries located in or near orchards in which spraying is practised, the owners assume that the mortality is due to the poisons used in the spraying mixtures. So far, there appears to be no proof that bees gather poison along with nectar and pollen, nor is there any instance on record of the poisons having been proved, by analysis, to be present in dead bees, bee larvae, pollen, or honey.

Dead bees may often be found not only on the blossoms of fruit trees which were not sprayed, but also on acacia and other flowers blossoming at the same time. Heavy losses of bees from unknown causes occasionally occur at the time of fruit bloom in localities where there are no fruit trees at all; while, on the other hand, apiaries located close to orchards in which the trees were sprayed repeatedly, suffered no perceptible loss and were in a thriving condition. Again, bees might not be affected by the amount of poison gathered with the nectar, but it might be sufficient to kill the brood. In an independent experiment, made last season, iron sulphate, one part in 400 of sugar syrup, was quite harmless to bees, but killed all the brood.

In the A B C and X Y Z of Bee Culture it is stated definitely that spraying trees during bloom is distructive to bees and brood. We quote—

"Now that spraying with various poisonous liquids has come to be almost universal among fruit-growers, the question arises, "Shall such spraying be done during the time the trees are in bloom, or before and after?" If it is administered when the petals are out, bees are almost sure to be poisoned, much brood will be killed, and many times valuable queens are lost. About the first thing one notices during fruit-blooming time, if trees are sprayed while in bloom, is that a good deal of the brood dies, until the bee-keeper begins to wonder whether the bees have foul brood, black brood, or pickled brood—unless the truth dawns upon him that they have been carrying in poisonous liquids from the trees that have just been sprayed."

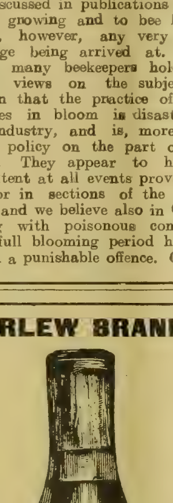
It is not advocated in this article that fruit trees should be sprayed when in full blossom; the spraying operations can usually be conducted either before or after the flowering stage.

It was pointed out in the January, 1911, article previously referred to, that rain at the blossom time seriously interferes with pollen action, and naturally liquid sprays would have the same effect. But there may be times when necessity compels the grower to spray at this season.

At the Burnley orchards, there are altogether over 1,800 varieties of fruit trees, which bloom at various times—from the end of August to the beginning of November. Hence, the trees, particularly the apple and pear trees, must be sprayed at a time when some of them are in bloom, with both Bordeaux mixture and arsenate of lead. And this occurs every season.

During last year, the pear trees were sprayed with Bordeaux mixture when some were in blossom; while, later on, a number of apple trees were

CURLEW BRANDY.



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rayed with lead arsenate when in oom. Under these circumstances was decided to make observations order to establish reliable data on is question.

At the Burnley apiary, the bee hives e right under the fruit trees, and the time of spraying with Bordeaux ixture the ground had not yet en ploughed, so that the spray l not only on any fruit blossoms hich were open, but also on the Cape eed then abundantly in bloom.

Neither the spraying with Bordeaux ixture nor the subsequent one with senate of lead had any effect whatver upon the bees, the colonies veloping normally and without any eck: there was not at any time ad brood in the hives. There is no ubt that under the atmospheric nditions prevailing at the time the raying of the trees proved quite rmless to bees. Observations will, owever, be continued in future, to monstrate whether spraying is inrious to bees at all: or, if so, under nat conditions.

◆

Ornamental Fruiting Shrubs.

Apart, therefore, from the oral aspect of plant beauty, ees and shrubs that provide a splay of fruit have a distinct alue in the garden during itumn and winter writes "The arden." Well-known examples cur among Rugosa Roses, the a Buckthorn, Arbutus Unedo, e latter one of the most beautil of hardy evergreens, which tains its zenith in midwinter, hen the opening flowers intermingle with the warty, ball-like, ndulous fruits. In this direcm there is great decorative auty in a good representative llection of Hollies, the yellowrried variety being most accepble, as it contrasts admirably ith the general run of red-berd kinds. The Symphoricarpus, Snowberry, gives quite a disnct type of fruit, and when seen a mass it is difficult to conceive a more excellent shrub for itumn effect. The Wayfaring ee (Viburnum Lantana), the oindle Tree (Euonymus europens) and the common Privet, elding, respectively, bright imson, orange scarlet, and ossy black fruits, are representive types of woodland trees pable of high decorative effect hen carefully grouped in posims that emphasise their disnct characters at this season. The genus Cotoneaster, as a whole, gives a large number of fruiting shrubs, frigida, Simonsii, pannosa, Franchetti and the newer applanata being among the best species to plant with this end in view. Berberis is also a heavy contributor. Vulgaris produces the showiest fruits among older kinds: but in the new species, Wilsonae, is seen an ornamental fruiting shrub of high excellence. In growth it partakes of the charcter of B. Thunbergii, but produces heavy crops of high-coloured coral red fruit. Of this genus Darwinii and Aquifolium give fruit of a rich purple blue, a colour that occurs again in Gaultheria Shallon.

Among dwarf shrubs, the Pernettyas are most showy. One gets pink, white, and crimson fruited varieties, so that when planted in quantity the display is particularly pleasing. Skimmias and Aucubas both provide crimson-coloured fruits, but in planting these it is well to ascertain the sexes and order them separately, as male and female flowers are borne upon separate plants: the female alone produces fruit. This also applies to the Sea Buckthorn. As a rule, one male plant to three of the fruit-bearing variety ensures perfect fertilisation, which is generally carried out by insect agency and by the wind. Among recent additions to evergreen shrubs, Viburnum rhytidophyllum carries fruits freely in autumn. These are dark red in colour, but it is not until the plant attains some size that one fully appreciates its decorative value in this direction. Many of the Honeysuckles (Lonicera), a large number of Pyrus, including the Mountain Ash, and several kinds of Sambucus produce conspicuous fruit. Of the last-named, S. racemosus bears fruits of the brightest scarlet colour.

The genus Rubus embraces a large number of fruiting species, and a few Vitis will mature coloured fruit. When planted under favourable conditions and in a good season, a plant of exceptional interest when it attains this perfection is Vitis heterophylla humulifolia, the fruit of which changes to a rich turquoise blue. In addition to the shrubs with highly coloured fruits, there are many that bear fruits of a less ornamental character such as the Bladder Senna (Colutea arborescens) and the Indian Bean (Catalpa bignonioides); the latter is bearing a remarkable crop of its long Bean like pods this year. It is not without interest to note that the most brilliant fruit-bearing shrubs have rather uninteresting flowers, a fact that may explain the studied neglect they frequently receive at the hands of planters. On the other hand, as foliage subjects they equal anything in the garden, and, in conjunction with their fruiting propensities, their merits for shrubbery and woodland planting call for wider recognition than is accorded them at present.

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TRY HARDY'S FAMOUS WINES

Pollination Studies in Various Fruits.

Whilst it is no doubt right to advise fruit-growers, from a commercial point of view, to limit the number of varieties they shall grow, knowledge of whether the varieties selected are self-fertile or self-sterile is desirable, as is also knowledge as to whether the varieties are early or late bloomers, because, taking an extreme case, Irish Peach apple and Bismarck are almost out of flower by the time Graham's Royal Jubilee commences, and they would therefore be obviously unsuitable for cross fertilising purposes. The remarks given here on the influence of the weather on the setting of fruit, are taken from an article by M. B. Waite, on "The Pollination of Pomaceous Fruits" in the "Year Book" of the Department of Agricul. ture. United States of America. —"Queensland Agricultural Journal."

Mr. W. F. Reid says, in reference to fruit-growing in London, that it is not the smoke that prevents trees fruiting, but the lack of insects to cross-pollinate them, and quotes an example of pears growing well at Clapham Common, where bees were kept.

As to the various ways in which different varieties of fruits are fertilised, the following notes may be of interest :—

Nuts.—Cobnuts and filberts are wind fertilised. It is therefore important to have plenty of pollen catkins, and in some planations a special variety, the Cosford cob, which bears many catkins, is planted here and there to ensure there being plenty of pollen. In the case of a nut-tree in a garden which has very few catkins, hazel boughs with plenty of catkins may be placed in the tree to provide pollen for the little red stigmas of the female nut blossoms. A plentiful supply of pollen is also necessary is walnut growing.

— Gooseberries and Currants.—

As to these fruits Messrs. Little and Avery covered certain bushes of gooseberry and red and black currant with muslin to exclude insects. The experiment demonstrated that it was absolutely necessary to have the help of bees, as these protected bushes had either no fruit whatever, or only a very few tiny fruits, whilst those around had plentiful crops, thus showing the importance of bees. Mr W. O. Backhouse found that the pollen of the gooseberry remains in a compact mass, that there is apparently no mechanism to ensure self-fertilisation, and that bees were consequently absolutely necessary to transfer the pollen: and in the case of one variety, "May Duke," so much nectar was secreted that unless drawn off by bees or other insects the anthers were in danger of being swamped. In gooseberries the pollen is found to be shed slightly before the stigma is ready to receive it but the stigma is ready before the anthers have shed all their pollen. In the red and black currant the anthers and pistil appear to come to maturity simultaneously. The flowers of gooseberries and black currants are much visited by bumble bees, as well as by hive bees. The bumble bees work later into the evening and in less attractive weather than ordinary bees.

— Plums. —

So far as plums are concerned, experiments made by Mr. W. O. Backhouse lead him to regard the different kinds of plum as on the whole "self-fertile," notably Victoria, Histon Apricot plum, blue bullace and sloe, whilst Diver's Early Prolific, the old green gage, and Black Diamond show themselves "self-sterile." These however, set fruit well when dusted with the pollen of another variety, but should not be planted in large blocks alone. In America a variety called "Tragedy" is found to be brought into greater bearing by the presence of Clyman, while Coe's Golden Drop, which is found to be "self-sterile" in both America and Victoria (Australia), fruits better when planted with Satsuma. It seems advisable in England not to plant more than two rows together of the same variety of plum.

— Cherries. —

Bees are of great importance to cherries. This has been very fully demonstrated on a large scale in California, and I should like to mention one example in Kent, told me by Mr. F. Shrivell of Golden Green, Tonbridge. Close to his house is a large Bigarreau cherry tree, which for many years bore good crops of fruit whilst there was a hive of bees near; but, on account of the bees getting "foul-brood," the swarms were destroyed and for two or three years there were hardly any cherries. On his restarting the bees, however, the cherry-tree again cropped well. In 1910 he lost his bees through inattention and omitting to feed them the previous winter, with the result that the cherry-tree's crop was a complete failure—too few to gather. Mr. Shrivell admits the flowering season was very wet, and that it was a bad cherry season, but says if the bees had been on the spot at every sunny interval they would have been in the trees, and he would have had a far better crop. In Victoria the Early Purple Guigne cherry is found to be "self-sterile," and in England the Black Tartarian cherry has been found not to set fruit when planted alone. Experiments are needed in this country to know which varieties of cherry are self-fertile and which self-sterile, and to ascertain whether the setting of cherries is aided by a mixture of varieties enabling cross-pollination.

— Pears. —

It would appear from the trials of M. B. Waite in the U.S.A. and F. J. Chittenden in Essex, that two-thirds of our different varieties of pears are "self-sterile." This fact is of great importance, and may account for many trees not bearing, especially where there is no other variety of pear near, nor any bees. Stigma of the pear was found by Waite to ripen before the stamens unless retarded by wet weather, in which case the stigma may remain enclosed by the petals until the stamens have reached maturity or even discharged their pollen.

As a result of experiments made it seems that the White Doyenne has proved to be a good polleniser for William's Bon Chretien in the United States of America.

A British example may also be given to illustrate the importance of cross-pollination in pears. In a field at Swanley, Kent, I planted forty Pitmaston Duchess pears, away from other pears. For four years, though flowering well, they did not fruit. I took them up and replanted them in another part of the farm in a small orchard of pears of other varieties, and placed a hive of bees amongst them. The following year they commenced to bear, and have, I understand, borne fairly well and regularly since. Mr. H. F. Getting, of Glewstone, Herefordshire, also finds that Pitmaston Duchess requires cross-pollination.

Mr. F. J. Chittenden, out of sixteen varieties of pears, only found two, Durondeau and Conference, to set fruit with their own pollen. In America, Duchesse d'Angouleme Beurre Bose, and Flemish Beauty are "self-fertile."

— Quince. —

Quince trees set their fruit perfectly with their own pollen.

— Apples. —

In Apples, as in pears, the stigmas usually mature before the anthers. Many practical fruit-growers have observed that certain varieties, if planted in large blocks, do not fruit well. Mr. Charles Martin, of Toddingon, finds the best Cox's Orange Pippins are produced in a planation in which these trees are intermixed with Duchess Favourite, a wonderfully free blooming variety, and apparently a good polleniser, the result being better than

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where intermixed with Warner's King or King of the Pippins.

Mr F. J. Cittenden microscopically examined pollen of over 100 varieties of apple, and found in most varieties 80 per cent. of the pollen perfectly formed. The only well-known variety in which the pollen was not good was Ribston Pippin, in which only about 40 per cent. was well formed. In testing the germination of the pollen a solution of 2½ to 5 per cent. sugar in water was used.

In apples it seems probable that in England quite 90 per cent. of the different varieties of apples are "self sterile."

Mr. Chittenden found, out of twenty-four varieties, that Gladstone, Stirling Castle, and King of the Pippins were the only kinds that set fruit with their own pollen. Messrs. Lewis and Vincent found in Oregon that Keswick Cohlin, Duchess of Oldenburgh, and Washington, were "self-fertile." Hive bees, humble bees, and other wild bees appears to be the chief pollenisers of the apple.

Professor Theobald tells me that black midges do much in the pollination of pears. Some fruits, such as the gooseberry and black and red currants if protected from bees will set practically no fruit, as by the construction of the flower and the adhesiveness of the pollen mechanical means are necessary to carry the pollen to the stigmas. Many other trees, such as most of the apples and pears and some of the plums and cherries, need, in order to set fruit, that their stigmas be pollinated with pollen from a different variety of the same kind of fruit.

— Strawberries and Raspberries.—

With regard to those, Mr. C. W. Richardson finds from experiments that most varieties of strawberries set fruit with their own pollen. Bees, nevertheless would appear to be valuable to a strawberry field, especially in a dull season, though they are not of the same relative importance as they are to apple, pear, plum and cherry. In strawberries and raspberries the stigmas are receptive before the anthers. Last year I bagged three lots of unopened raspberry flower-buds, on two different varieties, and was surprised later in the season to find the blossoms had set fruit nearly as well as in the open. The raspberry is, nevertheless, a very favourite blossom with hive bees, from the nector of which they produce a pleasant-flavoured, almost colourless, honey.

In conclusion one cannot doubt that greater knowledge of the pollination of our hardy fruits would be advantageous to all commercial fruit-growers. This knowledge can be gained by observations and experiments made by fruit-growers in different parts of the country, together with experiments stations and research laboratories. And all sound demonstrable data should be collected and tabulated by some such body as the National Fruit Growers' Federation.

Humus.

It is during a dry season like the present that the grower whether he be farmer, orchardist, market gardener, or amateur, has the importance of humus in the soil brought very forcibly to his notice, though there are no doubt some compensating advantages in the causes which result in the almost universal shortage of humus in Australian soils.

— What is Humus? —

Humus is decayed vegetable matter, and is the prime agent in promoting fertility in the soil. In its absence lands rich in all the elements of plant food fail to produce good crops. Analysis may show the soil to have more phosphoric acid and potash in it than could be exhausted from it by a long series of crops, and yet it will fail to produce, nor can it be induced to do so by the application of fertilisers of any kind unless and until filled with humus.

The soil without humus is practically dead, and a dead soil is an unproductive one. Leave a piece of land which has been rendered unproductive by constant cropping, without the return of any plant food, uncared for and unworked, and nature will set about its renovation by the restoration of humus. Weeds and the lowest forms of plant life will commence to grow, young forest trees will get a start, and the dead leaves and vegetable matter will each year be added to the soil. These in process of time will restore the fertility of the land. The process is a slow one, but it must be imitated by man if the soil is to remain a profitable one.

In experiments conducted in Minnesota it was found that continuous cropping for eight years cadsed an annual loss of over 2,000 lb. per acre of humus, due to the fermentation and decomposition of organic matter in the soil. This loss of humus changed the physical properties of the soil, causing it to be less retentive of moisture, lighter in color, and heavier in weight per cubic foot.

One of the great objects served by humus is that of forming a home for the millions of bacteria upon which it is now known depends largely the conversion of the soil elements into available plant food. In the absence of humus these forms cannot exist and multiply, and without them plants cannot get their food.

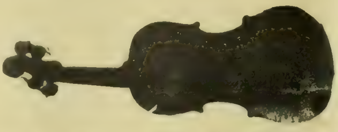
Another object served is the formation of humic acid, which is a powerful solvent of the mineral plant food, either naturally existing in the soil or applied to it in the form of fertilisers.

A third object is the keeping open of the soil so that the oxygen of the air can penetrate it, and carry its life-giving properties to the plant roots.

The humus being, then, of such importance in restoring and maintaining the fertility of land, it is of the highest moment to the grower that he shall know how to secure it. It may be done in several ways.

If his land is near a city he may buy manure from the city stables. This is the course largely adopted by vegetable growers residing near cities, but it is costly and is not capable of adoption on a large scale.

A third method of adding humus to the soil is by the growth of green cover, and particularly of leguminous crops. This method can and should be generally adopted.



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The Influence of Soil Moisture Content on Apple Trees.

During the past two years experiments have been carried on at Macdonald College (Canada) to determine to what extent soil moisture affects the development and functions of apple trees, particularly with reference to the quality of fruit produced, the setting of blossoms, and the amount of moisture in the trees.

In the first place it was found that, as a general rule, the moisture content of apple trees increases in direct proportion to that of the soil upon which they are grown. This rule was found to hold true in some two hundred samples taken during the winters of 1909-10 and 1010-11. It was further found, however, that an excess of moisture in the soil, and consequently an excess of moisture in the trees, caused a lower percentage of blossoms to set fruit, an increase of one per cent. in the moisture content of the trees bringing about a decrease of 10 per cent. in the number of blossoms that set fruit. The quality of the fruit, on the other hand, tends to increase in proportion to the amount of moisture in the soil. This result cannot, however, be entirely credited to the increase in soil moisture content, but must be partly due to the low setting of blossoms referred to above. Whenever there is a poor setting of blossoms we expect the fruit to be of better size and quality, since the trees throw the same amount of energy into the production of a smaller number of apples. We may therefore conclude that the increased quality of fruit in trees containing a high amount of moisture is due indirectly to the flooding of the trees, and directly to the low percentage of blossoms that set

One other fact worthy of mention was recorded during the course of this work, namely, that soil flooded in the autumn contained a lower percentage of moisture the following spring than soil not so treated. This is a rather startling phenomenon, and can only be explained by the fact that the water applied to the soil in the autumn washed a certain amount of the soluble organic salts from the surface layers. Since these salts are one of the main causes of the capillary rise of moisture in soils, it is reasonable to suppose that the surface foot of such a soil, five months after the water had been added to it, would contain less moisture than untreated soils.

The above results are the more outstanding ones of those obtained during this experiment covering two years, and the author wishes to emphasize the fact that this information should not, until further and corroboratory figures have been obtained, be taken as absolutely reliable, though the work, so far as it has progressed, has given very fair results.—Fred H. Grindley, in The Journal of Agriculture and Horticulture.

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Whenever medicine is given to animals it should be done as quietly as possible, because when a patient is upset or excited much of the ordinary effect to the medicine is lost, and the progres towards recovery materially retarded.

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Growing Fruit For Quality.

From " The Leader."

In recent issues, when dealing with the seasonable operations of fruitgrowers, our horticultural reporter directed attention to the value of thinning fruit. This practice is not necessarily confined to trees on which there are extra heavy crops; it may be adopted in every instance where fruits are growing close together, and which if allowed to remain will rob each other, with the result that there will be a poor quality average. In a recent issue of a New Zealand exchange we noted the following statement:—

"While engaged in thinning operations a Teviot fruitgrower took the trouble to count the apricots taken off several trees. As high as 2,300 were removed from a single tree, and the average for several years was 1,300. The trees are nine years old. As fewer than 200 apricots constitute a case, some idea of the productiveness of a Teviot orchard may be gauged from these figures."

Some growers fail to thin their fruit because of the extra work involved, and others excuse themselves by asserting that it means dead waste of all the immature fruit picked. Nevertheless it is one of the most profitable acts a grower can carry out in his orchard. It means the difference between a lot of low-grade fruit, which is disposed of at low and generally unprofitable prices, and a selection of large and well-developed specimens that realize top prices.

It may seem peculiar that where there is little or no decrease in the amount of fruit produced there is a decided decrease in the extent to which the tree is exhausted. The explanation is that the greater possible strain on the tree (and the land upon which it grows) is the development of seed (in drupe fruits, called pits); in fact, it is the reproductive faculty that matters, and which will be indulged in to the full if we do not interfere. It is the fruit we want, not pits. Why should the land be put to this uncalled for strain? It takes as much plant food to form one pit as would grow the pulp of two fine peaches. Thinning lengthens the life of the tree, because it is never put to undue strain, goes on in its bearing year in, year out, is more vigorous, and better able to withstand disease. The tree is not pulled out of shape and disfigured by broken branches; the fruit does not become ill shaped and fall off. It lessens the amount of disease of the fruit, more especially in peaches and plums. Where fruits touch each other there is much danger in a wet season from different rots; moisture is held between the fruits, allowing the spores to germinate, which would not happen on separate fruits, and disease once started spreads more rapidly from fruit to fruit.

Some few months ago The Leader published articles describing the progress of fruit culture in that section of New South Wales lying between Young and Bathurst. Over a wide range of country there is a marked tendency to plant export varieties of the apple, and one of the most enterprising growers is Mr. E. K. Wolstenholme, who has established a large apple plantation near Bathurst. This grower expresses emphatic opinions on the subject under notice. He submits that there are two principal reasons for the general neglect of this practical and useful operation. The first and most important reason is that it is one of the things that can be neglected, and still at times have fairly satisfactory results. The second is that the orchardist believes it to be a much more extensive operation than it really is. Perhaps they make it a more extensive one than it should be. When men are employed for a job such as this they must know their work and hustle, or clear out.

Mr. Wolstenholme claims that when any orchardist has thinned he will realize the satisfaction of marketing high-grade fruit at fancy prices. He will then be disgusted with his previous experience of small grade rubbish; also with the subsequent request from the agent for a cheque to pay cartage to the dump heap. The orchardist must look upon thinning as a sheer necessity. He must count the expense of thinning as a part of the business, just as sure as he has to buy boxes and paper, and to pay for packing and hauling, or any other necessary work. The question is not how much profit can be realized after all expenses are paid. For instaunce, one-half may often be taken off when immature, but if the remaining half should double their size there will be no loss in quantity, and great gain in quality. With very heavy thinning, which is really the best most years, we may diminish the number of cases eventually pulled from the trees. But which will pay the grower better—to have fewer cases that he can sell at a good price or twice as many which he cannot sell at all? Why should a grower produce fruit that is a disgrace to him, and through him to the district? He can only be harassed by inspectors and disappointed by returns. Then one must remember that as far as the actual labour is concerned, all the fruit has to be picked at some time. Why not half early in the season and the other half when matured? Perhaps some growers prefer to pick the whole crop when mature with shovels- off the ground? Why should not each grower recognise his individual responsibility? In the end the individual grower must be called to account if the sale of his fruit tends to lower the repute of his whole output.

Considerable judgment is necessary in the actual operation, for

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each tree must be treated as an individual. The thinning must be modified by the thrift of the tree, the evenness of its growth, and varying stanchness of its branches. For instance, some branches may require three-parts of the fruit taken off; while another on the same tree may be capable of maturing with ease all it sets. Although such irregularities should not exist, a tree may, and frequently does, demand such practice. The varieties of fruits vary in the way they hold their fruit. Some are in clusters, others singly or in pairs, and either may be close to the main stem or at the tips of long spurs.

The severity of the thinning depends on the use to be made of the fruit. Mr. Wolstenholme has never known peaches too large to sell well, or apricots, plums, and cherries, but extra large apples or pears may find only a limited market. Thin out to approximately 6 in. apart, or enough to allow the fruit to grow comfortably. The principal reasons urged for adopting the practice are probably in the order of their importance; that there is more number one fruit where it is thinned; in other words, better size, colour, and flavour. This means less grading, also better and easier packing. There is less drain on the energies of the tree. This means a greater probability of consecutive crop, and so regular income. The usual tendency is for a tree to overbear, and it so exhausts itself one year in forming fruit that it has no energy to grow fruit spurs for the year following.—"The Leader."

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Care Of The Orchard.

In advocating business-like methods in orchard management "Penang" in "The Australasian" writes:—

"One of the most astonishing features connected with the production of fruit is the great variation in the acre returns obtained by growers. It is such as to suggest that many are not getting half out of their trees that they are capable of producing. The fault in a great measure lies with the orchardist, for in the majority of instances he is responsible for the uncongenial conditions under which trees are expected to make remunerative returns. There are many orchards that do not make a return of £10 an acre over working and marketing expenses, while numerous other plantations return a clear profit of from £20 to £40 an acre, and sometimes more. The cause of these discrepancies is not difficult to find. It may be described briefly by the term bad management. Inadequate drainage, lack of sufficient cultural work, insufficient applications of fertilizers, poorly-arranged orchards, and a whole list of other matters, which either are neglected or are improperly performed, are all contributory factors to the general partial failure. Too many growers pass backwards and forwards among the rows of trees without observing or heeding their general appearance, or after observing the lowered vitality of some of them, fail to take measures that will bring them back to a proper condition of profit. If any part of a business is not bringing in the return of which it is capable the commercial man makes a close investigation to discover the cause, but in many instances where trees do not give a good account of themselves the matter is regarded as a natural consequence. In this way many a block is carrying numbers of individual trees that are little better than useless, and it cannot, therefore, be expected to reach its maximum acre productive capacity.

Arrangement of the Orchard.—

One of the most common faults to be found in commercial plantations is the great mixture of varieties planted in a block. A few apple trees planted at haphazard among a block of pears or isolated trees of one kind of apple planted near the middle of an acre or two of another variety, and so on, with an early peach intermixed among a large number of some late kind. This condition of affairs, which exists almost everywhere, and without regard to the number of unprofitable trees that may be included in such blocks, cannot do other than add to the expenses of management. Such trees are frequently overlooked when the crop is receiving attention or are neglected because the produce fit for gathering is insufficient to make a journey worth the while. If these trees were re-worked or rooted out and their places filled with trees of the same variety constituting the main block, and similar treatment meted out to unprofitable trees, the acre return would in a degree benefit thereby. For fear of misconstruction, let it be said that a judicious intermixture of varieties at the time desirable. The object of planting of planting out an orchard is two or three varieties of one species of fruit is to provide a medium for the proper fertilization of blooms. Consequently, while the practice is desirable, it should be systematically and conveniently carried out. This can be achieved by alternating the rows of each variety or by planting two rows of one and two rows of another. In this way each variety of fruit has a row alongside for cross pollinating purposes, and the practice may safely be extended so as to bring four rows of trees of a particular variety together, or even more. By this means a number of trees of each kind are planted so that their produce may be gathered in sufficient quantity to centralise the work and avoid the waste of time incurred by skipping forwards and backwards across the block to attend to a few trees. The inclusion of half a dozen or more species of fruit trees on blocks of small area is neither business-like nor profitable to its full degree.

Working the land.—

Indiscriminate planting has the further disadvantage that individual treatment cannot be given the trees. It is productive of waste effort. An irrigation may be desirable to ensure the swelling of the fruit at a certain stage in its development, but if varieties that ripen over different periods or other fruits are intermixed, then a deal of work is incurred that in the long run is of doubtful advantage. Among the reasons why a higher average profit is not derived from some orchards, lack of cultivation occupies a prominent position, and the comparative absence of drains to carry off surplus moisture is another common cause. The depth to which the land should be cultivated is controlled by the nature of the sub-soil, and in many instances ploughing and cultivation of the orchard land are too superficial. As a general rule, the plough furrows are turned from the first three or four inches from the surface when really a deal of benefit would result if the land was worked more deeply. In an established orchard the risk of injuring the roots is usually urged as a reason for shallow cultivation. The opportunity for preparing land for the downward extension of the roots is during the first six or seven years after planting, and if deep cultivation is then performed it may be carried on indefinitely, for the roots, instead of being near the surface, where they are liable to injury, will have gone down into the soil of their own accord. Far too little attention is given to the improvement of the mechanical condition of the soil. After heavy downpours of rain, the soil in many orchards sets so hard that it is scarcely possible to plough and cultivate it unless the work is taken in hand almost immediately. The conservation of moisture is, in this class of land, often difficult. The problem of taking on a big expanse of country would be difficult to deal with, but on orchards lands, where the area seldom exceeds 10 or 20 acres, this condition may be largely overcome by proper and inexpensive treatment. It is chiefly due to an insufficiency of humus, bad cultivation, and inadequate drainage.

—Green Manuring.—

The use of lime on many of the stiffer orchard lands would do much towards making the ground more easily workable, and, in addition, would make available great quantities of plant food that are now locked up out of reach of the roots of trees. Lime, while it cannot be classed as a manure, is a great factor in providing nourishment for the trees. Strikingly good results would be obtained by those orchardists who do not sow the land between the rows of trees with crops for ploughing under. The probability is that many soils that are now next to unworkable would, after having two or three successive crops of green manure ploughed in, such as field peas, cow peas, vetches, and other legumes, become lighter and more friable, and make it an easy matter to carry out cultural work. During the summer months a light soil mulch is desirable to conserve the moisture in the land for the use of the trees. The benefits from green manuring, however, do not end with the improvement of the general texture of the land. Crops such as have been mentioned provide manure for the trees in the cheapest possible manner, and during the period of their growth protect the land from washing away when heavy winter rains occur. In addition, by adding humus to the land they keep the soil more open, and promote bacterial activity. Moreover, in soils well supplied with humus a more uniform and adequate supply of moisture is stored up for the trees that is readily available, with the result that they are in a condition to longer withstand the summer heat, and better able to develop their crops to a normal size. All the subjects briefly touched upon are of importance in securing to the orchardist the fullest returns of which the land is capable, and, while the majority of growers are fairly well content with their yields, yet there is no reason why, with very little trouble, these should not be considerably increased. Large numbers of trees planted in Victorian orchards fail to return a case of fruit each year, and if these were either grubbed out or reworked, and greater attention was given to cultural work and the practice of green manuring, a marked increase would soon be noticeable in the acre value of the plantations.

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Calves Without Milk.

A series of experiments has been conducted at the Ontario College to test the above subject. The management in the early stages of weaning the calf and substituting skim-milk for whole milk is thus described. In another experiment, as soon as the substitution of skim-milk for whole milk began, the teaching of the calf to eat whole oats was undertaken. This was done by placing not more than a tablespoonful in the box in front of the calf after it had drunk the milk. In nosing about the calf got some of the oats in its mouth, and in a very short time learned to like them. Whole oats were preferred to rolled or ground oats, for the husk of the oat is then so thoroughly attached to the grain that it is masticated with the kernel, and the calf, having sharp teeth, has no difficulty in grinding it. The ration of oats was gradually increased as more of the whole milk was withheld and separator milk substituted, until at the end of three or four weeks the calf was getting half a pint twice a day. The amount depends on the calf, for some animals will eat the oats more readily than others. After the calves have finished the ration of oats, which requires an hour or so, they are released (from stanchions), and allowed to pass into a box stall provided with feed-racks about the walls filled with the choicest hay of the farm. The calves, even those only five or six days old, soon learned to pick this tempting bit of hay instead of sucking each other's ears, as they are apt to do when fed in the ordnary way. The average gain for the first 150 days for calves thus reared was at the rate of 1.50 lb. per head per day.

Calves brought up in this way are not very attractive-looking from six to twelve months of age. They develop a stomach out of proporton to the rest of their body, and their coat is not quite as smooth as it is when calves run with their dams. However, they learned how to eat and digest coarse feed in larger quantities than calves reared on whole milk. The dgestive organs were better developed for practical feeding from this period on to maturity than in calves fed on whole milk. It was suggested as the result of these experiments to make the change from whole milk to skim-milk slowly. Substitute about one-half pint of skim-milk for whole milk at each feeding until the calves are wholly on skim-milk, fed warm and sweet. The right temperature is between 85 degrees and 100 degrees Fahr., and this should be determined by a thermometer rather than by the hand. The grain should not be mixed with the skim-milk, but fed dry by itself.

The greatest difficulty that the calf feeder had to contend with was scours, and the principal causes were over-feeding, using dirty milk pails, very cold water, too much water after periods of thirst, and irregularity in feeding. The feeder, therefore, had to watch very carefully the effect of his feed upon his calves. This station was very successful in using dried blood as a tonic for weak or scouring calves. A mild case of scours was usually cured in from one to two days by reducing the milk and adding a teaspoonful of dried blood while the calf was drinking. In severe cases of scours the addition of one or two eggs with the dried blood was found to be very effective. Another remedy found successful was to give from 1 to 2 oz. of castor oil in the morning, and follow in about twelve hours with 15 to 20 drops of laudanum and a teaspoonful of dried blood. If the case was persistent one or two raw eggs were added.—"Canadian Journal of Agriculture."

Apples for Dairy Cattle.

An experiment with the object of ascertaining the suitability of apples as a substitute for roots and silage in the feeding of dairy cows was made a few years ago in Canada. The results showed that cows in milk throve satisfactorily on this diet. Each cow was given 25 lb. of apples daily in place of 30 lb. of roots and silage, the ration of hay and meal being unaltered. It was found that during the time the cows were fed on apples they not only milked more liberally, but at the same time increased in weight, and when the apple ration was stopped and replaced by roots and silage the animals lost what they had gained. The apples were of mixed varieties, and were apparently much relished by the cows, which seemed to improve in health as the result of the change. The plan is not recommended from an economical standpoint, but as the alternative to letting the fruit rot on the ground in seasons when it does not pay to market it.

Any branch of farming (says the "Massachusetts Ploughman") which increases the general fertility of the farm land, while paying a living profit, is worth more than another which steadily decreases the productivity of the soil. Robbing the land to make present profit is an unwise investment. Sooner or later we pay for it, and sometimes dearly. Now dairying, of all branches of farming, stands first in this respect. It can be conducted so that the farm land will steadily degenerate until the place is on the verge of ruin and abandonment ,or it can be made to improve the soil year by year. Many a dairy farmer has taken hold of poor abandoned farms and brought them up to a point where their valuation is almost doubled. Such men counted their profits in the living which they annually took from the place and in

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the higher valuation of their property. Keep a good dairy on any farm, and the fertility of it should increase. In order to bring up a poor farm by dairying, care should be taken not to have more stock than the land can afford. This is often the weak point in dairying. A man keeps fifty cows on a farm able to support only thirty or forty. The farm is bound to run down. There is nothing else for it to do, except to starve the stock or buy outside food, which always means poor economy. It is better to sell off the stock, weed out the poorest of the herd, and keep only so many as the farm can support, and leave a little something over. Do not farm up to the very limit of the soil. That is, do not take off each year quite all that the land will produce. Leave a little balance in the bank as a nucleus for future accumulation. Dairyman make this mistake and regret it when it is too late. As one succeeds in farming successfully with one hundred acres, keeping a herd of cows on it so that they have ample to eat and a little surplus over, more can be brought under cultivation and the stock increased. About half the dairy farms to-day need to have either the herd cut in two or half the land abandoned. That is, the former are raising too many cows to the acre, and robbing the soil, so that the farm is a little poorer each year, and the latter are only cultivating about twice as much land as they are capable of handling with their limited means. It is better to seed half the land to grass, and let it go at that, and devote the attention to strenuous cultivation of the remainder. A little radical change like this will work wonders on many a run-down dairy farm.

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Grooming of Livestock.

Grooming, or the application of the brush to the hairy coat of live-stock has results more far-reaching than is often dreamed of by the user of the brush. The skin is made up of layers upon layers of cells, among which are to be found small blood-vessels, nerves, and little pockets, or foldings in of the skin, known as glands. One of the effects of grooming is to irritate the small ends of the nerves, which communicate the irritation to the small blood-vessels, with the result of an increased blood supply to the skin surface. A result of the increased blood supply to the skin is the increased activity of the glands. The sweat glands get rid of waste material, and thus share the work of the kidneys and bowels. All are designed to work harmoniously for the common good, namely, the health of the animal, and if by any means one of these avenues of escape is stopped up that work is thrown on the remaining excretory organs, and it is only a short time until the effects of overwork tell on the other organs and ill-health results. The grease glands, when working well, make the skin oily and mellow, and the hair glistens, the result of the increased pouring out of this greasy matter from these sebaceous glands. A somewhat similar result comes from blanketing stock, due to the increased warmth, which dilates the blood-vessels, and thus causes an increased blood supply. The opposite effect on the skin results from exposure. Cold drives the blood away from the surface of the body, and hinders the work of the skin glands, in addition to throwing heavier work on the kidneys. The reason that live-stock will go through a winter ungroomed with long coats of hair and yet be apparently healthy is due to the fact that the skin glands of such stock are practically resting from their labours, as, owing to the lack of exercise, the skin is not called upon to work. Given work, however, calling the skin functions into play, and at once it is seen the handicap under which the long-coated, ungroomed animal suffers. In horses this is recognised by practical men, who clip their charges. The exposed animal needs a long coat of hair, which Nature provides, as the space between the outer ends of the hair and the skin is practically a dead air-space. This dead-air space is increased in animals when the "hair stands on end," as it is frequently called, a condition usually associated with exposure to a greater or less degree. A great growth of hair is not without its disadvantages It means a correspondingly greater draft on the body forces, or, in other words, expenditure of food. If food is used to make hair grow it cannot be used to build up or make an animal grow to any extent. The use of the brush will tend to remove dead skin scales, thus preventing the blocking up of the gland entrances besides stimulating the nerves controlling the blood supply to the skin. We can therefore reason quite easily that grooming means improved health to live-stock and economy of production to owners. —"Stock Farm."

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Butter-Making on the Farm.

— By Edwin H. Webster, Chief the Dairy Division, United States Department of Agsiculture, in Farmers' Bulletin No. 241. —

The principles of making butter are easily understood. When studied from the standpoint of present knowledge, most of the mystery that formerly surrounded the work of the butter-maker disappears. The making of good butter is not a system of "rule of thumb," but certain well-defined laws can be laid down, which, if followed, will insure success. Formerly the butter-maker had no system of reasoning that would show why his results were obtained. To-day every step is taken with knowledge and reason, and the result is practically determined beforehand.

On the farm the maker has control of every step in the process of making butter. Beginning with the supposition that the cows are normal and healthy, he starts with one ideal condition, namely, a source of pure milk. As the milk is drawn from the udder it should be free from any element that would cause its decomposition, but the fact that it will in a few hours become sour or show evidence that other changes have taken place proves that a foreign element is present to produce these changes. A study of these changes and their cause is the first and most important lesson for the butter-maker.

— Causes of Changes in Milk. —

Every one is familiar with the changes that often take place in milk and those which occur in the spoiling of fresh meats and vegetables, though the causes that produce these changes may not be apparent to the observer. It is also a matter of common experience that in hot, moist weather these changes take place with much greater rapidity than in cold or dry weather. Every one who has handled milk has learned that cleaniness in everything that comes in contact with it is one of the essential factors to success. Cold storage, such as may be supplied by the common household refrigerator, is also necessary for the keeping of milk and other perishable products in hot weather.

The cause of the spoiling of fruit, vegetables, meats and milk was found to be minute plant life, or germs, called bacteria. It was discovered that these minute forms of life—so small that it takes a powerful magnifying glass to see them—were the cause of all decomposition. A study of their life, habits of growth, the food on which they lived, the kind of substance on which they could develop and the temperatures most favorable to their growth revealed the scientific necessity for observing perfect cleanliness in all dairy utensils and for keeping the milk cold. It was found that bacterial life is everywhere, and only awaits the proper food, moisture and warmth to cause the bacteria to multiply very rapidly. Just as a grain of corn grows when given proper moisture and warmth, so the germ life that finds its way into milk utilizes the food and warmth found there to grow and multiply, causing decomposition.

It has been found that when milk or other perishable foods are kept free from bacteria they will not spoil; and, further, that foods of this nature when kept at low temperature are very much longer in spoiling, although they may contain great numbers of germs. When milk and other products are heated to a high temperature the bacterial life is destroyed, and the products will keep for a long time f no additional bacteria gain access to them.

The application of this knowledge forms the greater part of the science of butter-making. The amount of poor butter made on the farm indicates that some or all of these facts have either been misunderstood or ignored. Fortunately many species of bacteria known to exist are not harmful in milk. Many are beneficial, in that they develop flavors desirable in good butter. From this it appears that the knowledge of methods necessary to check or destroy bacterial development is but a part of the butter-maker's art. He must know how to promote the growth of the desirable kinds. Up to the point of ripening the cream the whole procees is one of retarding the development of bacteria by cleanly methods and use of cooling devices. When the ripening process begins the growth of favorable kinds is encouraged.

— Milking the Cow. —

Things for Milkers to Think About.—Too many milkers regard the work of milking as a dirty, disagreeable task. The work has resolved itself into nothing more than the manipulation of the udder and is to be hurried through with as quickly as possible. The element that takes from all drudgery its unpleasantness is wanting. That element is thinking along lines tending to improve the work. In the processes that attend the milking of a cow there is enough to cause the milker to study seriously the work that leads up to the making of a perfect pound of of butter. Milk as it is drawn from the udder is nearly free from bacteria. Could it be kept in this condition it would keep for many hours before any perceptible change would take place.

The first bacteria enter during the time of milking and are naturally from the cow and her surroundings. The manipulation of the udder works off hair, particles of skin, and in many instances particles of manure that adhere to the hair and udder. All of this material finds its way into the milkpail and carries with it great numbers of bacteria. The warm temperature and the presence of a congenial food supply that is in just the right physical condition cause these bacteria to multiply very rapidly, and, unless something is done to check their growth, souring or other evidence of decomposition will take place in a few hours. The rapidity with which these changes occur will depend almost entirely upon the temperature at which the milk is allowed to stand and the number of bacteria that find entrance to it. These facts are constantly in the

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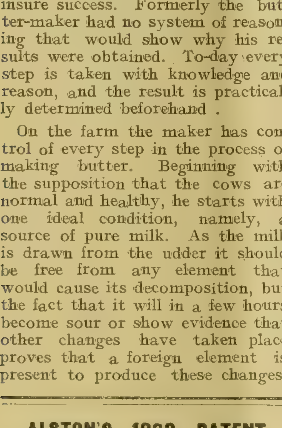

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mind of the careful dairyman. He knows that the first step is that of prevention. The work of milking should be performed in such a way that few bacteria will find their way into the milk. The milk should be cooled quickly and thoroughly immediately after it is drawn, in order to check the growth of these bacteria that will, under the best conditions, find their way into it.

Cleaning the Cow.—All this leads to the conclusion that the cow must be carefully cleaned. This is as good for her general physical well-being as for the protection and purity of the milk. The card or the currycomb thoroughly, but gently applied will remove all coarse dirt, straw, or other matter clinging to the animal that would eventually find its way into the pail. Aside from carefully cleaning the cow with the card or currycomb, the parts immediately surrounding the udder and the udder itself should be wiped with a damp cloth. This had best be done just before the milking begins, as it will remove most of the dust which may still remain after carding, and dampen that which is not removed, so that it will not fall into the milk-pail. If the milking is to be done in the barn there are some other important things that need attention. The air in the milking place must be free from dust; it matters not whether the dust comes from the floor, as a result of its recent cleaning, or whether the animals have stirred up the dust in coming into the stalls, or whether it is caused by the distribution of feed in the racks and boxes. Dust in the air will find its way into the milk, bringing with it great numbers of bacteria. If the floors are dusty they should be lightly sprinkled, so as to prevent the stirring of the dust. Feed should not be distributed just before or during the milking tour.

Clean Milkers.—Another thing of importance in connection with milking is the condition of the hands and clothes of the milker. He should be clean personally, and should be required to go about his work in clean clothes. The milking should be done with dry hands. The habit of some milkers of wetting their hands with milk just as they begin is a filthy and bad practice and the cause of much bad milk and poor butter. There is something in the presence of a milker in a white suit that calls for clean work, particularly if he is required to keep the suit clean while about his work. For this reason, as well as for the esthetic effect, many dairymen require their milkers to be dressed in white. The same principle is true in regard to whitewash on the interior of the barn. A carefully whitewashed wall shows off cobwebs to their disadvantage, and they will usually be removed. There is something out of place if part of a building is kept clean and fresh— as a whitewashed wall, for instance — and other parts are a mire of filth. Whitewashed walls go with clean floors, and the two with a white-clad milker will usually insure clean milk.

— The Barn. —

Construction and Care.—It will be seen from the preceding paragraph that the barn and its care have an important influence in the production of pure milk. As it is impossible to secure pure milk in a dirty barn, reeking with odors of manure, its construction must be taken into account. Plenty of air space must be provided in order to insure pure air, from 900 to 1000 cubic feet being needed for each animal. An abundance of window space must be provided. Enough light should enter to enable one to read a newspaper in the darkest places. The ventilation should be such that the air is changed every few minutes. Any one contemplating a new barn or a reconstruction of an old barn to conform with the ideas here mentioned should secure some good treatise on barn construction and ventilation. It is evident to any observer that one of the difficulties in securing good milk is the dark, poorly ventilated and constructed barns, containing rotten wooden floors that cannot be cleaned. Concrete is the best material for floors. It is economical and can be easily kept clean. If wood is used in floor construction it should be closely laid in pitch and kept in perfect repair. The interior of the barn should be kept well covered with whitewash, which acts as a purifier and makes the rooms much lighter. Stalls and feed-boxes should be simple in construction and easily cleaned.

Objections to Bank Barns.—As a usual thing bank barns are not good dairy barns unless the stalls are placed on the floor entirely above ground and the basement is used for srorage of implements or purposes of similar nature. A basement as ordinarily constructed is dark and damp and has low ceilings. It is difficult to ventilate and is entirely unfit for housing animals. The drainage of the yards around the barn is very important. Yards must be dry and firm. An accumulation of manure in the yards is very objectionable. The dairyman who compels his cows to wade knee-deep in manure before they can get into the barn can never expect to secure good milk.

(Continued on page 466.)

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The public hospital is not always the most hopeful place to go when one is told they cannot get better, and this is why Mr. Dennis Dunn, of 44 Barnett Street, Kensington, Victoria, took Clements Tonic. This letter tells its own story, written 1/9/11.

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"In fairness to the proprietors of Clements Tonic, it is my duty to say what it has done for me. It was in 1906, my illness started, I had perfect health up to then. One day, while I was at business, I felt a bit off. When I got home a cold perspiration broke out, and everything became a blank. My sight and hearing was affected, and I had to be lifted into bed and rolled in warm blankets. A doctor was sent for. After some weeks I was able to get up a little, but for 12 months I was not able to go to work, and during that time I consulted twelve doctors. One said my heart was weak; another my liver was in a bad state; and if I can read faces, the others were puzzled as to what my complaint was. I was then an out-patient of two Melbourne hospitals. I was suffering from pains in my side, and lost a stone and a half in weight. Reading one of your phamphlets, I decided to try Clements Tonic. After a few bottles I began to mend rapidly. Altogether I have taken a dozen bottles, and am in good health and spirits again.

(Signed) DENIS DUNN."

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Maize.

—The Importance of Good Seed.—

The average yield per acre of maize, or indeed of any agricultural product, is invariably much less than the best yields. This difference will be as marked whether a small district only or the whole country is considered. Conditions of soil and seed bed preparation largely account for this, but not entirely. The quality of the seed sown is undoubtedly one of the controlling factors in crop production, yet it is one which to some extent is overlooked by the farmer. This is, perhaps, specially so with those crops which are of secondary importance. Growers fail to realize the loss to themselves and the country which must follow such neglect. Far too many farmers consider seed good simply because it will grow.

In Bulletin 415 U.S.A., Department of Agriculture the question, "What constitutes good seed corn?" (maize) is asked.

The obvious reply is that to be first class, seed must be—

(1) Well adapted to the seasonal and soil conditions where it is to be planted.

(2) Grown on productive plants of a productive variety.

(3) Well matured, and preserved from ripening time till planting time in a manner that will retain its full vigour.

The importance of the three requirements just enumerated has been demonstrated experimentally by the Office of Corn Investigations of the Bureau of Plant Industry. The results given briefly, as enumerated, are as follows:—

(1) For a series of five years 12 well-bred varieties were tested in 10 northern States, equivalent lots of seed being used in each State. Varieties that produced most in some States were among the poorest in others.

(2) Seed ears taken from the highest yielding rows of ear-to-row breeding plats have repeatedly produced better than seed ears taken from poorer yielding rows. Seed ears from the best producing stalks found in a general field produced more than seed ears taken without considering the productiveness of the parent stalks.

(3) Four bushels of ears were divided into two equal parts, one part being well taken care of and the other placed in a barn as corn is ordinarily cribbed. The well-preserved seed gave a 12 per cent. increase in production on poor soil, and a 27 per cent. increase on fertile soil, notwithstanding the fact that both lots of seed germinated equally well.

—Make Seed Corn Gathering a Special Task.—

At corn ripening time drop all other business and select an abundance of seed corn. The process is too important to be conducted incidentally while husking. When selecting seed corn give the process your entire attention. Get the very best that is to be had and preserve it well, and your increased yields will return you more profit than any other work you can do on your farm.

The only proper way to select seed corn is from the stalks standing where they grew, as soon as ripe and before the first hard freeze.

—Propagate only from the Best Producing Plants.—

As soon as the crop ripens, go through the field with seedpicking bags and husk the ears from the stalks that have produced the most corn without having any special advantages, such as space, moisture, or fertility. Avoid the large ears on stalks standing singly with an unusual amount of space around them. Preference should be given the plants that have produced most heavily in competition with a full stand of less productive plants.

Late maturing plants with ears which are heavy because of an excessive amount of sap should be ignored. Sappiness greatly increases the weight and it likely to destroy the quality.

All other things being equal, short, thick stalks are preferable. Short stalks are not so easily blown down, and permit thicker planting. Thick stalks are not so easily broken down, and in general are more productive than slender ones.

—Treatment of Seed Immediately after Gathering.—

The same day seed corn is gathered the husked ears should be put in a dry place where there is free circulation of air, and placed in such a manner that the ears do not touch each other. This is the only safe procedure. The writer has repeatedly seen good seed ruined because it was thought to be already dry enough when gathered and that the precaution mentioned above was unnecessary. Many farmers believe that their autumns are so dry that such care is superfluous. Seed corn in every locality gathered at ripening time will be benefited by drying as suggested: If left in the husk long after ripening it may sprout or mildew during warm, wet weather or become infested with weevils.

The vitality of seed is often reduced by leaving it in a sack or in a pile for even a day after gather-

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ing. During warm weather, with some moisture in the cobs and kernels, the ears heat or mildew in a remarkably short time.

The best possible treatment immediately after gathering is to tie the ears separately at a distance of 3 in. apart to lengths of binder twine. Each rope of ears consisting of about 15 [illegible] ears, which, when the end is tied to the ropes, wires, or rafters running across the room or shed in which the seed is to be dried, will hang clear of contact with any other ear. Permanent seed racks are more convenient than the use of binder twine, and when they are located in a dry, breezy place, the ears dry successfully.

—Destroying Weevils or Grain Moths.—

If at any time signs of weevils or grain moths show on the corn it should be inclosed with carbon bisulphide in practically air-tight rooms, bins, boxes, or barrels for 48 hours. The bisulphide should be placed in shallow dishes or pans on top of the seed. One-half pint is sufficient for a box or barrel holding 10 bushels or less. One pound, costing about 1/3, is sufficient for a room or bin 10 ft. each way. After fumigation the ears must be thoroughly aired, taking care that no fire is present when the fumigating box is opened.

—Winter Storage of Seed Corn.—

After hanging in the shed or lying on the racks for two months, the seed ears should be "dry as a bone," and contain less than 10 per cent. of moisture. They can remain where they dried or be stored in mouseproof barrels or boxes during the winter, but in either case must not be exposed to a damp atmosphere or they will absorb moisture and be injured. Some farmers place the thoroughly dried seed ears in the centre of a wheat bin and fill the bin with loose, dry wheat.

—Preventing Injury from Weevils and Grain Moths.—

In localities where weevils and grain moths injure stored grain, the thoroughly dry seed ears should be stored in very tight mouseproof receptacles, with 1 lb. of moth balls or napthalene inclosed for each bushel of corn. This quantity tightly inclosed with the corn will prevent damage from these insects and will not injure the seed. A shilling's worth will protect seed enough to plant 60 acres.

—Testing the Germination of Seed Corn.—

Seed corn that matured normally and has been properly preserved will grow satisfactorily. It is very poor management to neglect proper preservation and to spend time in the spring separating by germinating tests those ears that have been badly damaged from those that have been slightly damaged. Prevention is better than cure, and in this case a cure is impossible.

Ears slightly damaged by poor preservation may germinate well, but will produce less than if they had received better care.

Make a seed corn testing box and test 100 ears separately. Be sure that each kernel tested is perfect in appearance and was not injured at the tip when removed from the ear. If three or more kernels out of 10 from any ear fail to grow, it will be advisable to test every ear in the entire supply of seed corn. If the 100 ears tested contain no poor ones further testing of the supply is unnecessary.

—Grading Seed Corn.—

Shelled corn is difficult to grade satisfactorily. The grading can be done better before the ears are shelled. If the seed ears vary greatly as to size of kernel they should be separated into two or three grades according to size of kernel. These grades should be shelled separately, tested in the corn planter, and numbered to correspond with the number on the planter plates that are found to drop them most uniformly. These arrangements can be completed before the rush of spring begins.

—Seed ears should first be stripped of the small kernels from the tips of the ears and the round thick kernels from the butts. The former are less productive than the other kernels of the ear. The round butt kernels are as productive as the other kernels of the ear, but do not plant uniformly in a planter.

—Hand Shelling is the Best Method.—

Shelling seed corn carefully by hand is profitable. The greater the acreage planted the greater the profit. Into a shallow pan or box each ear should be shelled separately, rejecting any worm-eaten or blemished kernels. If the supply from the one ear appears good and contains no poor kernels, it is poured into the general supply and another ear shelled in the same way.

—Summary.—

If you have ever found yourself compelled to plant corn that was not fit for seed do not be caught that way again. It is too discouraging to begin the season with poor prospects of a good crop. Get your seed at ripening time when the best quality is most plentiful. Get an abundance, enough for planting again what the high water may destroy and a supply for some farmer who may move into your community or for a neighbour who could not select his seed corn at the proper time.

Save seed only from the most profitable individuals with the same care you use in propogating your animals.

Care for each living kernel from the time it ripens until it is planted in a manner that will enable it to develop into a thrifty plant and produce one or more large ears. Do not expect germination tests made in the spring to restore vigour that proper gathering, drying, and storing would have retained.

Shell your seed carefully by hand.

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Importance of Clean Milk Cans.

Owing to the fact that milk is a most delicate, changable article of food, great pains should always be exercised to handle it in a cleanly manner.

Rusty cans should certainly not be tolerated, neither by the manufacturers of the product nor the suppliers. Even a single rusty patch in a can is indicative of an unsavory state of affairs, and when milk is exposed to such infective or contaminating influences its commercial value as well as its wholesomeness, is liable to be much reduced.

Rust creates a sponge-like, honeycombed condition in the texture of iron, casein lodges in the numerous interstices thus formed, providing food for the growth of various families of objectionable and putrefactive organisms. From these emanate an infective or putrefying series of ferments, which are distributed throughout the milk or cream stored in the can. Furthermore, a peculiar chalybeate or rusty iron flavour is noticeable in the dairy products, be they milk, cream, cheese, or butter, as a result of the lactic acid generated in the milk attacking the iron and combining and dissolving it. And not only is the milk in the cans themselves affected adversely, but also the whole supply in the receiving vat. There is even a possibility of detached particles of rust finding their way into the cheese and butter made from such milk. Hence, it can be seen how imperative it is that cans showing rust in their bottoms should at once be sent to the tinsmith to have them renewed.

And what if the body of the cans is similarly affected? Then reject them and get new ones. Well-made cans are preferable, and as a result should by all means have sound lids, not likely, under reasonable conditions, to come loose, and so necessitate the daily use of rags and cloths to secure them firmly, this being another dirty and objectionable practice. If they do become ill-fitting through carelessness or other causes, it costs but a trifle to have their rims remodelled and rendered serviceable again.

When the cans have been brought back to the farm, and the skim-milk or whey emptied from them, the next thing is to see that they are thoroughly cleansed. Cold water should first be used in rinsing out the milk, for the reason that milk contains a certain proportion of albumen (white of egg), and if hot water is used instead, the albumen is cooked on the sides of the vessel, there to remain and become a menace to the next can of milk. This should be followed by washing with boiling water, and for prolonging the useful age of the can one of the most effective agents is the use of a solution of ordinary washing soda, in the proportion of 1 lb. of soda to 20 gallons of water. Provided this solution is applied boiling hot, it is beneficial in two ways, namely, by serving as a wholesome and innocuous germicide or microbe-killer, and also a preventive of rust. rinsed with water well boiled, and afterwards inverted on a raised platform, exposed to the sunlight, out of range of any objectionable odours and where there is no floating dust. Sometimes the cleansing can be done by steam at the factory where the milk is delivered, and when so it is undoubtedly the best way.

Not only should milkcans thus be cared for, but the interiors frequently examined to detect any flaws in the seams, which, with dents, are as dangerous to the sound-keeping qualities of milk as rust or dirty rags around the lids. Even in cleaning a can, the use of a cloth or rag is not commendable; much better is it to have a good, sound brush, for with that all the difficult places both inside and out can be more effectually reached.—"Farm and Home."

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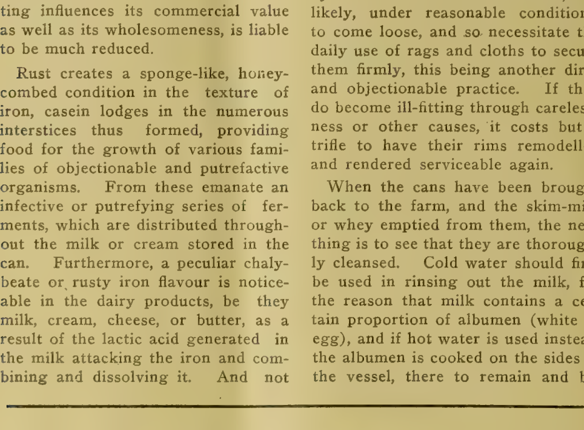

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Feeding Fat in to Milk.

Probably one of the most thorough experiments ever made to determine the much-discussed question of feeding fat into milk was recently undertaken by Dr. Jordan, of the New York Experiment Station. The results are discussed in the following interesting manner by Mr. W. A. Henry in an American journal:—"Dr. Jordan was one of those who doubted the possibility of feeding fat into milk, and he choose to feed a cow for some time on a ration that contained no fat, or but very little at most. How could such a ration be got together? All feeding stuffs, or rather all that can be used with the cow, carry more or less fat. To get practically fat-free feeding stuffs for his cow, Jordan sent 1,000 lb. of chopped hay and 150 lb. of corn meal and ground oats to the Cleveland Linseed Oil Company for treatment. This company manufactures linseed oil by the extraction process from the flaxseed, and so had the apparatus and methods ready for taking oil out of various substances in a large way. A light benzol was used by the company, and this took out the fat from the feeding stuffs, which were then returned to the New York station.

A Jersey cow, young and vigorous, was chosen for the experiment. She was thin in flesh, and about four months advanced in a period of lactation. At first this cow was given a normal ration, consisting of untreated timothy hay, corn meal, ground oats, and wheat gluten. Her production with this ration was recorded. Then her food ration was changed, and she received the same kinds of feed, but with the fat taken out of them. Wheat gluten is fat-free naturally.

Now, if the cow must get her milk-fat directly from the feed she eats, then something out of the usual should happen with a cow so nourished. Never before had a cow been fed a ration with practically no fat in it. What did happen was the usual—this cow went right on making normal milk. Indeed, she even gained in weight during the trial. When the summaries were taken, Jordan found that during the trial the cow had produced 62.9 lb. of fat in her milk. During this period she had taken in with all her food only 11.6 lb. of fat, of which she digested only 5.7 lb. During this time she gained 47 lb. in weight. She was in better condition than when the experiment started, and some of this betterment must naturally have been fat added to the body. Thus, after more than half a century of battling among the scientists, it has been settled beyond per-adventure that the cow need not have fat in her food with which to put fat into her milk.

Whence, then, comes the fat in the milk of the cow? Animal physiologists place the protein of feeding stuffs first in importance. Physiological chemists generally started on their path by Liebig and Boussingault have given the protein in the food first place, and this properly. Some of these would have the fat in the milk and the body as well derived wholly from this source. Jordan determined the total amount of protein given to this cow during the experiment. He conducted digestion trials, by which he found out what part of the total protein went into the body proper and what protein came out in the solid excrement—such portion having never really been in the body. Of that which entered the body proper, he determined how much was passed off as waste through the urine and what appeared in the casein and albumen of the milk, which is the protein portion of that fluid. The results of the studies in this line show beyond question that only an inconsiderable part of the fat in the milk at most could have come from the protein in the food.

By elimination we have left then the carbohydrates as the main source of the fat in the milk of the cow under study. The carbohydrates in the foods used consisted of starchy matter and wood fibre principally. Naturally we do not think of these as capable of producing fat, and yet there is no question of the truthfulness of this proposition when we have examined all the data of the experiments. The cow is one of the animals that do not care for and seem to be unable to use any considerable amount of fat in their food. Dogs and humans are lovers of fat. The cow does require a very considerable amount of protein in her food—much more than she puts into her milk or is required to maintain the protein waste of her body. Protein seems to be the simulant and maintainer of the animal organism, furnishing a stimulus which has to do with the conversion of starchy matter, woody fibre, and sugar which plants contain into milky fat. It seems to be left, however, for the carbohydrates—the sugar, starch, and the woody fibre of feeding stuffs—to be utilised for supplying the heat and energy of the body and for building up the fat and sugar portions of the milk.

Half a century ago those greatest of all agricultural scientists, Lawes and Albert, of Rothamstead England, showed plainly in opposition to the general trend of the thought of that day, that the pig could make fat out of sugar and starch. Jordan has shown that the cow can make milk-fat likewise out of the carbohydrates. Not content with the studies of a single cow this patient investigator repeated his work in a larger way, with three cows, the results fully confirming the earlier studies.

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Individuality of the Cow as a Factor in Economic Milk Production.

Economy in milk production is of prime importance both to the producer and to the consumer. There is a wide range in the cost of production, due to a large extent to the individuality of the cow. The cause of the difference in individuality has been studied bp the Missouri (U.S.A.) station, where careful comparisons were made of good and poor cows. Two Jersey cows from the same sire were found to digest their feed equally well, and both required about the same amount of feed for maintenance.

The real cause in the difference in production was found to be in the amount of feed consumed above that required for maintenance. During the year the better cow consumed 3,424 ℔. of grain, 2,904 ℔. of hay, 8,778 ℔. of silage, and 4,325 ℔. of green feed. The other cow consumed 1,907 ℔. of grain, 1,698 ℔. of hay, 5,088 ℔. of silage, and 2,120 ℔. of green feed. In general the better cow consumed 1.7 ℔. of feed for 1 ℔. consumed by the other cow, and produced 2.67 ℔. of milk and 2.77 ℔. of fat for each pound produced by the inferior cow. The better cow consumed 3.27 ℔. of grain per day for maintenance, and the other 2.92 ℔. Both took hay and silage in the same proportion. The better cow required for maintenance for the entire period 1,200.8 ℔. of grain, 1,204.5 ℔. of hay, and 4,818 ℔. of silage, which left available for milk production 2,233.2 ℔. of grain, 1,699.5 ℔. of hay, 3,960 ℔. of silage, and 4,323 ℔. of green feed. The inferior cow required for maintenance 1,065.8 ℔. of grain, 1,065.8 ℔. of hay, and 4,292.4 ℔. of silage, leaving available for milk production 841.2 ℔. of grain, 632.2 ℔. of hay, 795.6 ℔. of silage, and 2,102 ℔. of green feed. These figures show the large amount of food left for milk production in the better cow, which was 8,522.9 ℔. of milk, containing 5.51 per cent. fat. The other cow produced 3,188.9 ℔. of milk, containing 5.31 per cent. fat.

Goats give milk which is richer than the average cow's, and it may be drunk with almost perfect confidence.

Sanitary Care of Pigs.

In bulletin (189) of the Virginia (U.S.A.) station Dr. Mayo points out that in the successful raising of swine there are problems, other than that of feeding, which often determine success or failure. The most important of these is the preservation of the health of the swine. Wherever a considerable number of animals are gathered together the risk from disease is considerably increased. Extra precautions must then be taken to guard against disease and to keep the animals in thrifty condition.

The first essential is that their quarters be kept clean and sanitary.

In purchasing swine, care should be taken that they come from herds free from tranmissible diseases, that they are healthy, and have not been exposed to disease in transit. Public stock yards are liable to be infected with hog cholera; it is dangerous to bring swine from such places and put them in a healthy breeding herd.

It is an excellent plan to have a quarantine pen some distance from all other swine, and so located that there is practically no danger of transmitting diseases to the herd. All recently purchased animals should be held in quarantine in such a pen for 10 days, to be certain that they are free from disease, before placing them in a healthy herd.

If a disease of swine occurs in the neighbourhood keep away from these farms, and do not allow any one who has been on an infected farm to visit your herd. If your swine have access to a stream of running water and disease appears on a farm located above yours on the same stream remove your hogs at once, as the infection is liable to be carried by the stream. Dogs and buzzards also are liable to carry the infection of hog cholera, and should be kept away if possible. Such measures are simple, but they are very important.

—Range for Swine Necessary.—

While a few swine can be raised confined in limited quarters, if such quarters are kept clean, they will do better, will keep in better health, and can be grown more cheaply if they have plenty of range for pasture. It is desirable to have the pasture fenced off into suitable areas so that the hogs can be shifted from one pasture to another, not only to provide fresh pasture, but also to afford an opportunity to disinfect the pastures, either by plowing and seeding to a forage crop or by exposure to sun and weather. Nearly all cases of intestinal worms, which are rather common in swine, are contracted from infected ground, and swine can be kept free from these parasites by frequent changes of pasture.

The more common of the minor troubles are mange and lice. For the first, dipping in lime sulphur dip prepared as follows is advised:—Slake 8 lb. of lime with sufficient water to make a thick paste. Sift in 24 lb. of sulphur, and mix well with a hoe. Put this mixture in a kettle with 25 or 30 gall. of water and boil for at least one hour; two hours is better. When ready for use, add sufficient water to make 100 gall. of dip. This dip should be used warm—100 degrees to 110 degrees F. The dip is applied most effectively by means of a dipping vat.

Dipping vats are made of wood, galvanized iron, or cement. They are set in the ground at a convenient place so that there is good surface drainage away from the vat. A good size for a vat is 10 ft. long on top, 8 ft. long on bottom, 1 ft. wide on bottom, and 2 ft. wide on top. The end where the hogs enter should be perpendicular, and the other end inclined, with cleats, so that the hogs can emerge after swimming through. The entrance should be by a slide. Such a tank is very useful wherever hogs are kept in numbers, as frequent dipping tends to keep the hogs healthy and free from parasites.

For pigs and small shoats that can be readily handled, a barrel serves the purpose well; the pigs can be caught, plunged in the dip, and held there the required time. Some successful swineraisers build cement bathing places or wallows for swine, and keep these filled with a watery solution of some dip or disinfecting solution. If swine have wallowing holes filled with water some of the good dips should be put in these frequently.

After dipping or treating swine they should be placed in clean, uninfected quarters. To disinfect quarters all litter and dirt should be thoroughly removed and scattered on land not frequented by swine. The floors, partitions, and other parts should be thoroughly saturated with one of the dipping solutions described above. They are best applied by means of a force pump which drives the solution into all cracks. After it is well dried the pens should be whitewashed, care being taken to fill all cracks well. An excellent

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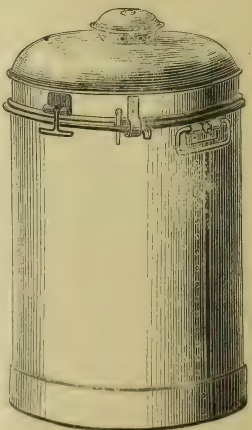


disinfecting whitewash is made as follows:—

Slake 25 lb. fresh lime in sufficient water to make a paste, sprinkle in 15 lb. of flowers of sulphur, add 30 gall. of water, and boil for an hour. Then add enough water to make 50 gall., and apply with a spray pump.

Dipping in coal tar dips of the creolin type is an effective remedy for lice.

If the hog wallows are kept well filled with water, to which some of the creolin dips are added every 10 days. The swine will usually free themselves from the lice. Another good way of combating the parasites is to tie gunny sacks or other coarse cloths around rubbing posts and keep these cloths saturated with crude petroleum.

Fattening Up Thin Horses.

A knowing horseman can make good profit in fattening up horses that have become run down, and for that reason may be purchased for a low price from the owners, who do not know how to plump them up again, or even renovate them for service. It is usual to find one or more customary causes in such conditions. Look first to the teeth. In many instances, irregularities, or a broken or split or sharp tooth, or long tooth, grown up high, on account of a cavity above or below, corresponding with a missing molar, keep the horse from properly masticating his food, or deter him from eating the amount necessary to keep him in good condition. Where such things are found they may be speedily set right by the proper use of the veterinary dentist's instrument, and the horse will at once pick up and do well.

If the teeth are found to be in good condition, next lift the tail and examine the region of the anus, for worms are a common cause of thriftlessness, and their presence is indicated by a fur of scaly material about the anus. Worms must be got rid of if the thin horse is to be fattened. All the food imaginable will fail where worms are plainly sapping the blood and strength. For worms give 2 oz. of turpentine shaken up in one pint of raw linseed oil. Administer it after starving the horse for 12 hours, and follow it up with a drachm of dried sulphate of iron night and morning in the feed for one week. Then skip ten days, and repeat for another week to destroy the worms hatched out from the eggs remaining in the intestines, following the first treatment. If the horse still lacks appetite, add two drachms of powdered gentian root to the iron at each dose, and he will soon go to eating greedily.

When the teeth are all right and evidences of worms are absent chronic indigestion is the next cause to be suspected. As a rule, no medicine need be given other than a preliminary physic ball or a drench of raw linseed oil. Follow with molasses mixed with each feed. At least one quart of molasses should be given twice daily. Mix it with a like amount of water, and then incorporate it intimately with cut hay, coarse wheat, bran, and corn meal. Feed whole oats at noon, and long hay at night. This is good feeding in ordinary cases, but where the horse is very thin and covered with sores, or showing other evidences of indigestion, the amount of molasses may be greatly increased.

In certain worn-out army horses as much as 12 lb. of molasses has been given daily along with cut hay or grass, and the results have been astonishingly good. In fact, such horses plumped up so quickly that their former drivers failed to recognise them in six weeks after the feeding process commenced.

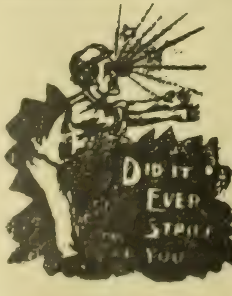
In most cases of chronic indigestion clipping the hair usually works like magic, and we would strongly advocate this practice, provided the horses are to be stabled comfortably, as they should be, if it is desired to fatten them quickly in short order. Exercise should be restricted during the feeding period. Care will have to be taken, however, that the horses do not become constipated. If they should show any signs of that condition, mix a couple of tablespoonfuls of glauber salts in their feed, night and morning, or dissolve it in the drinking water. The feeding of carrots or well-made silage will, however, obviate the necessity of using salts, and it is best, if possible, to get along without medicine.—"Canadian Dairyman."

Water in the Soil.

The water that plants use is that which remains in the soil after drainage, and is held in the form of a film of moisture around each particle of earth.

Good agricultural soils hold capillary water equal to about 30 per cent. of their weight. Plants are not able to use this water after it has dried out to about 12 per cent., so that when the soil is in the best condition for plant growth, only about 60 per cent. of the total moisture is available to the plant. During the dry season loss of water takes place by evaporation at the surface of the ground as well as through the leaves of the plant. Fortunately for the roots of the plant, this water tends to maintain an even balance; that is to say when a portion of the soil dries out, this water moves toward the dry place from the point of greatest moisture. An example of this is when the surface dries, and water from below comes up to take the place of that lost by evaporation. When water has been taken out of the soil by the roots of plants, other water moves towards this spot, and, of course, carries with it soluble plant food, provided there is any in the soil.

The rapidity of movement of capillary water depends upon the size of the soil particles and the proportion of fine and coarse particles. Water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will move more rapidly through coarse sand than through clay, but as the water is held in the soil in the form of a thin film around the soil grains—and there being more surface of the soil grains in a cubic foot of fine clay than in the same quantity of sand—there will be more water moved in the clay soil in a given time than in the sand, although the water moves more slowly in the clay than in the sand. Hence clay soils do not suffer from drought as much as sandy soils.

Most agricultural soils, when composed of the proper mixture of sand and clay, have a tendency, under normal conditions, to form small clusters of soil particles, just as small particles of sand tend to cling to larger ones, thus bringing about the best mechanical condition. This mechanical condition is destroyed when the soil is stirred while wet. This is called "puddling." Soil so handled, when exposed to the direct rays of the sun, becomes very hard. This condition is known as "baking," and simply means that the granular structure has been destroyed, and the soil particles cemented together by drying. Soils allowed to bake in this manner are very difficult to put in good condition again. The mechanical condition may be improved by the use of shade crops, such as velvet beans, &c. The shade allows the slow action of capillary water to restore this cluster condition. Working when the land is in proper condition will also tend to improve the soil.

A controlling factor in soils, so far as moisture is concerned, is humus. Humus is partially decayed leaves, grass roots, or other organic matter in soils, which, on account of the great number of cells, has a high water-holding capacity. The presence of humus makes the soil dark or black in colour, so that in most countries a dark soil is regarded as a rich soil, but such is not always the case.

All soils in tropical climates are more or less devoid of humus unless they have been recently cleared of their virgin forest, or are formed of the washings from surrounding hills. The main cause of this absence of humus, however, is the fact that decomposition goes on constantly, and the excessive rainfall washes out the soluble matter.

The presence of humus not only adds fertility to the soil, but makes it more porous and open, thus increasing the water-holding capacity, which is an important factor during the dry season.

The character of the subsoil has considerable influence on the amount of moisture that will be available for the use of plants. As mentioned above, the supply of capillary moisture is the governing factor in plant growth. Also only a limited amount of moisture is held in the soil, hence the storehouse below the surface must be large, so that the capillary water may be drawn up from 6 or 8 ft. below the surface. A thin layer of soil underlaid with gravel will suffer much from drought, while, on the other hand, a deep layer of clay insures a good supply of moisture during the dry season, but provides poor drainage in the rainy season, when good drainage is essential except for rice and few grass crops.—"Agricultural News."

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Frequent Calving.

As all know, a cow carries her calf nine months, and is capable of producing a calf every ten months. This is multiplying pretty frequently, and there are many who encourage it, while others are in no such hurry. The question is, which is the best for a cow—to produce a calf as often as possible, or with more than the necessary spaces between? The matter is worth considering, and there are pros and cons bearing on it. Take the minimum time of calving. If this occurs every ten months or thereabout, the cow will yield milk for a period of seven or eight months after each calving. She will give pretty freely but not long. The frequent calving, too, is fagging on the constitution, and the frequent-calving cows go to pieces and fail sooner than those that calve less frequently. At the first glance, the most profitable and satisfactory cow would appear to

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STRAPS.—Saddle Straps from 6/, doz.; Hobble Straps, 9d. 1/, each. Rings, 4d. 6d. good quality.

REINS, Single Cart, strong, 7/6, 8/6; Spring Cart 7/6, 8/6; Leading, 11/6 for 25 feet, 16/ for 36 feet; Cross Reins, strong, Waggon, 12/6, 13/6; Cross Reins, Buggy, Silver Buckles, best 14/6, 15/6. For folded hand parts add 6/ Bridle Reims, 2/6; Silver Buckles, 3/6.

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be the frequent calver, but I question very much if this is so when all the points are taken into account. The mere fact of being in calf reduces the milk supply. It decreases as the embyro calf develops, and the cow fails in her yield more or less much sooner than the animal that may go twelve, fourteen, or sixteen months from calf to calf, and I believe that if the milk from two identical cows was weighed, measured, or computed in value, one producing three calves in, say, thirty one months, and the other only two in that period, that the latter would prove the more profitable animal, both in produce and her own condition. If a cow brings a calf in ten months after the previous one, and decreases in her yield considerably at four or five months, and the one that has a lapse of twelve or fourteen months from calf to calf keeps her milk up well for ten or eleven months, she is more likely to be the favorite. A period of twelve months from calf to calf is quite often enough, and it had better be a month or two more than that, much less. A plan is to have all or a great lot of cows coming in to calve together, or nearly so. There is a full supply of milk for a time, but a woeful scarcity at the opposite end, and all with a keen eye to the fitness of things will see that the calving is regulated to make the supply as constant as possible. It is not possible to influence the milk supply to any great extent by feeding or other facilities apart from the times of calving. —"Indiana Farmer."

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Rats and Their Destruction.

Despite the incessant warfare of man the common rat continues to extend its range and steadily increase in numbers. Its dominance is due to its great fecundity and its ability to adapt itself to all sorts of conditions. It breeds three or fourtimes a year, and produces from six to twelve, and even more young at a litter. Young females breed when only four or five months old. It is practically omnivorous, feeding upon all kinds of animal and vegetable matter. It makes its home in the open field, the hedge row, and the river bank, as well as in stone walls, piers, and all kinds of buildings. It destroys grains when newly planted, while growing, and in the shock, stack, granary, mill, or ship's hold, and also in the bin and feed trough. It invades store and warehouse and destroys fur, laces, silks, carpets, leather goods, and groceries. It attacks fruit, vegetables, and meats in the markets, and destroys by pollution ten times as much as it actually eats. It carries disease germs from house to house, and bubonic plague from city to city; it destroys the farmers' pigs, eggs, and young poultry, and damages foundations, floors, doors, and furnishings of dwellings.

Poisoning is the method most generally adopted for the destruction of rats, and one of the cheapest and most effective poisons is barium carbonate, or barytes. This mineral has the advantage of being without taste or smell; and, in the small quantities used for poisoning rats and mice, is harmless to larger animals. Its action on rodents is slow, but reasonably sure, and it has the further advantage that the animals before dying, if exit be possible, usually leave the premises in search of water. Its employment in houses, therefore, is rarely followed by the annoying odor which attends the use of the more virulent poisons.

The poison may be given in the form of a dough made of one-fifth barytes and four-fifths meal, but a more convenient bait is ordinary oatmeal, with about one-eighth of its bulk of barytes, mixed with water into a stiff dough, or the barytes may be spread upon bread and butter or moistened toast. If a single application of the poison fails to drive all rats from the premises, it should be repeated with a change of bait.

Strychnine is a more virulent poison, but its action is so rapid that the animals often die upon the premises, a circumstance which prohibits its use in occupied dwellings. Elsewhere strychnine may be employed with great success. Dry strychnine crystals may be inserted in small pieces of raw meat, sausage, or toasted cheese, and these placed in the rat runs; or oatmeal may be wetted with a strychnine syrup, and small quantities laid out in the same way.

Strychnine syrup is prepared as follows:—Dissolve ½ oz. of strychnia sulphate in a pint of boiling water; add a pint of thick sugar syrup, and stir thoroughly. A smaller quantity of the poison may be prepared with a proportional quantity of water. In preparing the bait it is necessary that all the oatmeal should be moistened with syrup. Wheat is the most convenient alternative bait. It should be soaked overnight in the strychnine syrup.

The two poisons most commonly used for rats and mice are arsenic and phosphorus, nearly all commercial preparations containing one or the other as a basis. While experiments prove that rats have great powers of resistance to arsenic, it may sometimes be used advantageously as an alternative poison. Preparations of phosphorus sold by druggists are often too weak to be effective; and home-made mixtures, when of sufficient strength, are dangerous, as rats may carry the baits into walls or crannies, and thus cause fires.

For poisoning rats in buildings and yards occupied by poultry, the following method is recommended:—Two wooden boxes should be used, one considerably larger than the other, and each having two or more holes in the sides, large enough to admit rats. The poisoned bait should be placed on the bottom and near the middle of the larger box, and the smaller box should then be inverted over it. Rats thus have free access to the bait, but fowls are excluded.—"U.S.A. Bulletin."

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Green Manuring.

Green manuring is an economical practice for various reasons. It is even more worthy of attention now than at earlier periods, for the reason that there is more need of adding vegetable matter to the soil to counteract the action of the greatly-increased quantities of artificial fertilisers used, or, perhaps more correctly, to provide a suitable foundation for the chemical manures to act upon to the best advantage. The ploughing-down of green crops is, in a measure, a substitute for farmyard manure. The action of the one resembles that of the other, if it does not equal it. Green-manuring is a more valuable system on light sandy soils than on clay or loam land, as it not only improves the physical condition of the soil, but it also increases the quantity of humus or vegetable matter, which in reasonable proportions is so valuable an element of fertility.

If the land be already rich in humus, green-manuring may not be beneficial, even although it does tend to open-up and facilitate the aeration of the soil. In any case, any adverse effect which it might produce could easily be counteracted by dressings of lime or potash. It has been proved by practical demonstration that the fertility of light soils can be vastly improved by green-manuring with one or other of the various leguminous crops. Besides adding to the amount of humus the leguminous crops bring with them into the land the nitrogen which they have collected from the air. Thus green-manuring effects an appreciable saving in the artificial-manure bill, as nitrogenous fertilisers, by far the most costly of all the artificials, are rendered unnecessary, and indeed, are advantageously superseded.—"The Field."

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The White Ant.

Insects of the family Termitidæ, the family to which the "white ants" belong, feed on wood and dead vegetable matter, and live socially in mixed colonies of sterile and fertile individuals. The term "white ant," by which these insects are known, is entirely inappropriate insofar as it indicates any relationship with the true ants, as they are not ants, but belong to the order Isoptera, being closely allied to the book-lice.

The popular acquaintance with the termite is derived from seeing it on its nuptial flight when the small, brown, winged insects emerge from crevices in buildings and ground. These are the colonising forms, and not the ones which actually do the damage, for the real depredators are the soft-bodied, large-headed, milky white soldiers and workers. No insect occurring in houses is capable of doing greater damage than Termes flavipes, and since their entrance to buildings is effected by soil channels, and their work cannot usually be detected before considerable damage has been done, not only their eradication, but their detection is a difficult matter.

In every colony there are four forms—males, females, soldiers, and workers. The males have a pair of compound eyes placed just above the antennal fossae, and when young two pairs of large membranous and approximately equal wings, projecting beyond the apex of the abdomen when at rest. They live permanently with the females. The females when young closely resemble the males, but later, when they become mothers of colonies, this resemblance is not so close. The soldiers are sterile, wingless, and usually blind. Their heads are chitinous, strong, and peculiarly adapted for defence. They act as protectors of the colony, although occasionally assisting the workers. The workers are sterile, wingless, usually blind, but little chitinised, having short and powerful jaws, and larval in appearance. They attend to all the duties of the colony, such as building the nests, caring for the young, and ministering to the wants of the queen. All except the migratory winged forms are incapable of enduring sunlight, as the soft delicate bodies of the other forms shrivel when exposed, and, consequently, all their operations are done under shelter.

At the time of the nuptial flight, the winged forms emerge in pairs, and, under favorable conditions, each pair may establish a new colony, but as they are preyed upon by many insectivorous animals, this rarely happens. As soon as a king and queen have established a new colony, they superintend the rearing of the first brood of workers and soldiers until these are able to assume their special duties in the colony. Henceforth, the queen loses all power of locomotion, is constantly fed by the workers, and her size increases considerably. She now becomes an egg-laying machine, laying many thousands of eggs per day. When any accident befalls the queen, a "supplementary queen" is developed from a very young larva, being smaller, however, than a true queen, but serving the purpose of egg-laying equally as well.

As so many of the colonising forms are destroyed during their nuptial flight, the more usual rule of the formation of a new colony is the splitting up of old colonies. As methods of prevention, and remedies against white ants, the following may be mentioned:—(1) Coat all foundation timbers with tar. (2) Build the foundations of buildings entirely of brick, stone, or concrete. (3) Fumigation with hydrocyanic gas at the strength of 1 oz. of potassium cyanide per 100 cubic feet of space. (To make this gas, the required number (x) of ounces of potassium cyanide is weighed out; to this is added twice the number (2x) of fluid ounces of sulphuric acid, and four times the number (4x) of fluid ounces of water.) Fumigate in a tight room to which access cannot be gained during the operation, as the gas is a most deadly poison. After the room has been closed, put the acid and water into an earthenware vessel and drop into it the cyanide contained in a bag attached to a string which runs freely through a keyhole. After fumigation has gone on from one to two hours, open the room from the outside and allow it to air for not less than six hours before entering.—"Agricultural News."

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Houses and Rent.

The rent question is ever present. It is not to be dismissed by merely attacking the landlord on the score that he wants too much rent. The proof of the rent is in the net return on the investment over a period of years representing the life of the houseless land and the increment thereon. In our larger cities the rent question has become intense. State intervention has occurred in one instance in the shape of a proposal to erect cottages on a wholesale plan and let them at a low rate of interest. While there is something to commend itself in this, there are a few features of more or less importance of the other kind. In any such proposal some dependence may be had on 'Savings Bank funds, and what of the position of a man who has been saving up to get a house for his old age. His thrift provides the means for a competitor to come in and destroy that form of investment. When the State can dictate the interest on the money it borrows it is no very difficult thing to fix the interest on the money it invests at below a commercial rate. Then the State can take chances which the individual must avoid, as if it throws away a few hundreds of thousands it is hardly noticed. Rents in the ordinary way obey a common law. First there is the question of supply and demand, and then the increased cost of production. If the trades engaged in producing a house enjoy a wage return of 25 per cent. in excess of what would have been paid 10 years ago, then the "goods" costing more must be sold for more. "'But what of an old house?" may be asked, "seeing that this was built before that increase." The answer is that it obeys a common law in rising to the new one, while it must be remembered that if things are dearer the landlord has to live as well as others. But this doesn't settle the question as applying to the poor—the people who have not participated in the general rise of wages, but who have to participate in the general rise in rents. Desperate conditions demand extreme remedies, or remedies out of the common. Whether it is the State or the municipality, or a company, or a very wealthy individual, the question of providing homes for the poor can hardly be set aside by showing that the average landlord either exacts only a fair thing or something more than a fair thing. Some notable object lessons are provided in England. There they have many garden suburbs, and far more in process of development. A notable feature is the stopping of avercrowding, and in this connection it is of no use drawing comparisons, as overcrowding has resulted chiefly from a certain form of evolution through restricted transit. Cheap transit, electric trams, rapid trains, and motor omnibuses promise more for elbow room than could ever be effected by all the philanthropists alive without these conveniences. Overcrowding in the old country—and it will be found to apply to all countries to the extent to which they are affected—has reduced the stamina of the people afflicted by it, warped their character, and increased both crime and disease. The building laws of London allow 44 houses to be built on the acre. The diagram shows how 44 houses must be crowded to be so compassed, and what, according to a London editor of note, an acre should carry as the limit of its residential capacity. Experience there has shown that overcrowd- affects the birth rate. Statistics are available to prove that while 27.9 per 1,000 is the average birth rate in England and Wales, in ordinary conditions 56 per 1,000 is the rate in the garden suburbs so far completed and occupied. An English capitalist has demonstrated in the construction of 50 cottages with white fronts, red roofs, green grass plots, and nice gardens, that the capital invested may be made to return a net of 4 per cent. on a rent of 4/6 per week. What would be the equivalent of this in Australian cities? It would vary in different cities, of course, but say a net of 6 per cent. on 10/- per week. If men of means, no matter whether in corporation or individually, go to pains to provide nice homes for the poor for a low rental, we may be sure that the latter is based on a minimum of repairs. Here is a question whether the tenant is not sometimes the enemy of his class, and where, as a consequence he has not that much of the remedy in his own hands. Every tenant who knocks a house about is not getting even with his landlord so much as passing a burden on to other tenants. A London authority recommends a housing council in every municipality, to influence a fair balance as between landlord and tenant, and to appeal to popular sentiment by developing something like a mutuality of interests.

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◆

No man can tell what a cow will do in the production of milk until she has been giving milk for two or three years.

The silo is undoubtedly the most economical way of handling green fodder, storing much in a small space, and keeping it in the best condition to feed, thereby increasing dairy profit and correspondingly enriching the farm.

◆

Cases of hernia are so comparatively frequent amongst males, and especially those who have to handle and carry heavy weights, that a word of caution may not be out of place. The necessity of having recourse to a suitable truss the moment that the slightest protusion shows itself cannot be too strongly urged, and the neglect of this precaution has been the cause of much suffering. If a good fitting truss is secured the patient suffers little inconvenience, but as the fitting of the truss is a most important point it is imperative that a thoroughly skilled truss-maker should be consulted, and those who require treatment should consult to Mr. K. Bechtel, of 59. O'Connell Street, North Adelaide. Mr Bechtel is a thoroughly competent truss and bandage maker, and in most cases undertaken a cure is guaranteed. In addition to trusses and bandages he also makes Patent Attachable and Detachable Buggy, Spring Cart, Yankee and Cab Saddles, to order, and forwards to any part of the Commonwealth. Country orders receive special attention.

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(Continued fron page 455).

— Milk Utensils and their Care. —

Character of Utensils.—Not all the bacteria that find their way into the milk come from the cow or barn. Often milk-pails, strainers, cans and other utensils used for handling the milk are the source of such trouble. Faulty construction of these vessels is very common There should be no hidden, inaccessible places in milk vessels. The seams should be soldered over smoothly, inside and out. Cheap tinware is usually not well soldered, and if such is purchased it should be taken to the tinner to have all seams carefully gone over, closing up all that are open and cannot easily be cleaned. Galvanized iron is sometimes used for milk-pails and other dairy vessels, but this should not be, as the galvanized iron is rough on the surface, and affords hiding-places for innumerable bacteria. Wooden vessels should not be tolerated, under any condition, for holding milk, for it is impossible to keep them clean. Rusty tinware, besides its effect in imparting rusty or metalllic flavor to the milk, is objectionable for the same reason. Good tin is the only practicable material for milk vessels, and this must be kept shining and bright.

Cleaning the Utensils.—The proper washing of milk utensils is something that is often misunderstood. All milk should be rinsed from the surface of the tin before it comes in contact with boiling water, as the heat will cook the milk onto the surface, forming a coating very difficult to remove. If this coating is not removed, it furnishes food and place for bacterial growth. This is especially true around places liable to remain moist. After rinsing the vessel free from milk, it may then be washed in hot water. There should be added to the water some good cleansing compound. Some of the so-called washing-powders are very objectionable, as grease of some kind is used principally in their make-up. When such powders are used a coating of thick grease will be formed around the edges of the sink or pan containing the wash water. All such compounds should be discarded. Powders can be procured that are guaranteed to contain no grease, and they are usually excellent cleansers. If these are not obtainable, the thing to use is ordinary commercial sal soda and a little borax, which are cheap and effective.

For scrubbing the surfaces of milk vessels a good brush should be used. There is nothing more objectionable for this purpose than a cloth, particularly the cloth that has been used for washing the dinner dishes or the pots and pans. A good hand brush can be purchased for a few cents. It is the most effective and can be easily kept clean.

Drying and Sunning Utensils.—The final rinsing of dairy vessels should be in boiling-hot water. If they are allowed to remain a few minutes in the hot water, all the better. The heat will reach every part, and be continued long enough to destroy all bacterial life. After the rinsing in boiling water the surface will quickly dry, and should be allowed to do so naturally. Turn the vessels so that it will drain, and in a few moments the heat in the metal will dry the surface. A cloth for drying can rarely be kept clean, and for this reason does more harm than good. It is an excellent practice to stand the pails and other milk vessels in the sun so that the rays will reach every part of the inside. Most species of bacteria cannot live in

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the direct rays of the sun. For this reason milk rooms and similar rooms for handling milk products, except cold-storage rooms, should be built so that the sun light can enter in abundance Dairy rooms are usually damp, and if dark will permit the growth of molds and the development of bacteria, and will speedily become unfit as places to keep milk. The troubles with stringy, or ropy, milk usually occur in places of this kind, and can be overcome by a thorough cleansing and the admission of plenty of air and sunlight.

— Handling of Milk After it is Drawn. —

Milk is often spoiled by allowing it to stand in the barn too long after it is drawn. It readily absorbs odors from the air, and odors of the barn are usually much in evidence. For this reason the milk should be quickly removed to a place free from odors.

The Milk Rooms.—If milk is placed in a cellar or cave where there are decaying vegetables or fruits it will quickly absorb the odors from them. Such places are entirely unfit for the storing of milk. The dairyman should have a building set apart from the barns or other places from which objectionable odors might come, for the exclusive use of the dairy. This building need not be very large, but must be constructed so that it can be easily kept clean and cool. A cement floor should be laid, as it is the easiest to clean, is cool, and does not rot from moisture. If the walls are built of stone, brick, or concrete, so much the better, for such walls keep out the heat.

The roof construction should be such that it will effectually turn the heat of the sun. If the roof is not of concrete, it should be built double, so that an air current will pass between the upper and lower part. Walls and ceilings should be covered with cement plaster, whether wood or stone is used in their construction. This finish, if properly put on, is easy to clean and does not readily become affected with mold or decay.

The Water-Supply.— Provision must be made for an abundance of water, and the pumping arrangement must be such that the fresh water from the well or spring will flow through the dairy house. It should run into a tank built deep enough to allow the complete submerging of the milk and cream cans. The tank should have sufficient width and length to hold all that it may be necessary to use. A tank built up of concrete and finished with a cement surface is the most economical in the long run and is much more satisfactory. Provision must be made for draining it out for purposes of cleaning. Wooden tanks are usually a source of trouble from leaks and decay. Iron tanks do not last long, because they become rusty.

Use of Steam.—In a moderate-sized dairy there should be added to the equipment a small steam-boiler, which should be in a room separate from the dairy. There is always need of steam, and the additional cost involved is but little compared with the benefits obtained. If steam cannot be provided, a small hot-water heater of some kind should be used. It is essential to have plenty of boiling water for purposes of washing and scalding milk vessels and the floors and walls of the building.

(To be Continued).

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Mud.

When ponds, tanks, or ditches are being cleared out, the mud taken from the bottom can frequently be utilised with advantage, although the composition of the sediment will naturally depend upon the character of the surrounding soil and the nature of the pond.

The composition of one or two samples of mud from ponds in England, together with notes as to the uses of the material, were given in an article that appeared in a late number of the "Journal" of the Board of Agriculture of Great Britain. A sample taken from a pond at Kew contained 45.15 per cent. of moisture, 0.439 per cent. of nitrogen, 0.27 per cent. of phosphoric acid, 12.04 per cent. of lime, together with magnesia and other alkalies, equal to 0.97 per cent. A specimen of pond mud from Nottinghamshire contained 78.81 per cent. of moisture, 0.862 per cent. of nitrogen, 0.32 per cent. of phosphoric acid, and 7.79 per cent. of lime.

Where a pond is situated at the lower end of a field, it is likely to receive, after rain, surface washings which may possess considerable manurial value. On the other hand, if the pond is one formed by springs, the sediment may be of little or no value.

At Kew the pond mud is used for general gardening purposes, and as a mulch for beds, borders, and trees. It has also given good results as a top dressing for grass. Before use, the water should be allowed to drain away, and the mud broken up.
such material is as much of a mecha-

It is pointed out that the effect of nical nature, and if used on land of a lighter or drier texture, would assist in improving its physical condition On heavy land it probably would not be so successful.

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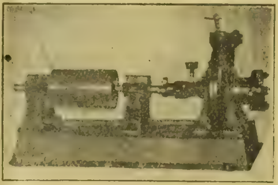

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The Use of Kainit as a Plant Food and Fungicide.

By A. J. Ewart, in Victorian Journal of Agriculture.

Kainit is a natural mineral manure which has long been used in Agriculture as a potash manure, but which, according to recent work, has also other uses. In the pure form, the mineral was formerly supposed to consist of potassium sulphate, magesium sulphate and magnesium chloride combined with water. It seems more probable, however, that it really consists of potassium chloride and magnesium sulphate combined with water. It is usually, however, mixed with potassium chloride, rock salt and other impurities. As a general rule it is stated samples containing much chlorine are also rich in potash. To some extent the presence of salt is objectionable, particularly if the amount exceeds 30 per cent. For such a crop as mangolds, however, the presence of salt is actually an advantage, if not too abundant; but for many crops, as well as for flowers and fruit trees, the presence of salt in any amount may exercise a more or less pronounced injurious effect. In such cases where a supply of potassium is needed and cost is less important, simple potassium salts may be used, such as the sulphate or chloride; and, on a small scale, the more expensive nitrate.

The usual application is at the rate of 4 to 8 cwts. per acre., and, as a general rule, better results are obtained when it is applied to sandy, calcareous or humus soils, than when it is used on clays and loams. To get the best results the soil must contain a sufficiency of lime, and in pastures the effect is more noticeable on the quality than on the quantity of the herbage. Naturally, it would be little use applying it to a soil already sufficiently rich in potash, and this is best told by actual trial.

Crops which have specially high potash requirement are potatoes mangolds and other root crops, carrots, onions, fruits and all kinds of leguminous crops, peas, beans, clover, etc., For grasses and cereals potash is usually less necessary, but recent experiments in the United States showed that the application of a mixture of phosphates and kainit quadrupled the yield of hay, as compared with long unmanured plots, and its use was found to result in the production of a greater yield of marketable potatoes than the application of any other form of potash. On the other hand, some experiments carried out in Germany showed that when kainit was applied to the soil in the form of a heavy dressing before or after planting, it appeared to excise an unfavourable influence upon the development of the skin of potatoes which would probably affect their keeping qualities and resistance to disease. Its use was not, however, found to produce any perceptible effect on the amount of potato scab. Experiments in the south of the United States showed that kainit was more costly as a fertilizer for cotton than chloride of potassium, whereas experiments in England, near Leeds, showed that the finest malting barley was grown with a mixture of nitrate of soda, superphosphate and kainit. The use of kainit has also been found to increase the proportion of seed to straw in peas, beans, oats and rye.

It has also been claimed that kaint is useful both as an insecticide and as a fungicide. It is doubtful whether it has any sufficiently powerful action to be of any direct use, either as an insecticide or fungicide. It does, however, appear to render the plants to which it is applied more resistant to certain diseases; and, according to recent work, this effect is best shown when it is used in the form of a spray applied to the foliage. Applied to potatoes in the form of a 2 per cent. solution, it appeared to make them more resistant to disease and to increase the yield without producing any pronounced decrease in the percentage of starch in the tubers. On the other hand, when applied to the soil in the usual manner, it had no perceptible effect on the disease of celery known as "Black Heart"; and, wherever it has been tried as a preventive for rust and smut, it appears to have been almost, if not entirely, a failure. This mineral has also been used to add to farmyard manure in order to preserve it and diminish the loss of nitrogen. It has not, however, been found to be particularity effective, and the addition of kainit to manure does nor preserve it as well as does [illegible] and covering it with a layer of soil.

The practice sometimes followed of strewing kainit on the bedding of domestic animals is a bad one. It exercises an injurious action on their feet, and it has been found that, when swallowed, it is irritant or even toxic to chickens.

One curious action of kainit is worthy of note. It appears that, when applied to the soil in large amounts, it increases the conductive power of the soil for heat and hence keeps its temperature more

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uniform. Exactly how it acts is not quite certain, but the application of kainit at the rate of 100 to 300 lbs. per acre was found in Germany to reduce the formation of frost. When applied in still greater amounts, if forms a crust on the surface of the soil and appears to render it liable to a greater variation of temperature than before any was applied. These facts are of interest because they show how complicated may be the action of any manurial substance when applied to the soil.

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Benefits of Cultivation.

What are these benefits? Professor L. H. Bailey enumerates them as follows:—

1. Tillage improves the physical condition of the land (a) By fining the soil, and thereby presenting greater feeding surface to the roots; (b) By increasing the depth of the soil, and thereby giving a greater foraging and root-hold area to the plant; (c) By warming and drying the soil in spring; (d) By reducing the extremes of temperature and moisture.

2. Tillage may save moisture—(e) By increasing the water-holding capacity of the soil; (f) By checking evaporation.

3. Tillage may augment chemical activities—(g) by aiding in setting free plant food; (h) By promoting nitrification; (i) By hastening the decomposition of organic matter; (j) By extending these agencies (g, h, i) to greater depths of soil.

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Farm Notes.

Poultry for profit must be studied from a practical standpoint, just as any other stock on the farm. A hen is not a large creature, but the poultry industry is large.

A real, shrewd, live dairy-farmer will make it his business to know what a cow should earn, in order to bring him a fair profit. This he must do by comparison either in reading or by observation.

A real, shrewd, dairy farmer realises that he must either read or travel extensively to see what other men's herds are doing. It has simply amazed hundreds of men when they once wake up, to see in what a place of darkness they have been living.

Halter-pulling is a bad trick in a horse. Often it is brought on by careless usage in the stall. Never do anything that would frighten a horse in his stall. Look to it that no one else does, either.

When a horse gets to gnawing at the manger the best thing to do is to cover everything gnawable with tin. Better do it before the habit is formed however.

Some of the rainy days can be spent profitably in looking over the harvest machinery. A missing bolt or loose nut may cause an expensive delay.

The most important essentials in the erection of a pig-sty are to have it where it can have perfect drainage and plenty of sun-light. Stagnant water, where the sun rarely shines, is the ideal medium for the incubation of disease germs.

It is impossible to build up and maintain a dairy herd except through discriminating selection, and this can only be attained where careful records are kept.

The cart-horse has an adaptability that belongs to no machine, however ingeniously constructed, and it is impossible that he will ever be dispossessed of his place.

The commercial pig to be profitable must be strong, healthy, a quick grower, and a rapid fattener. In order to secure these qualities the selection of parents of the right stamp is absolutely essential.

Performances most enjoyed by dairymen are not exhibitions of cows' fancy dancing and high kicking, but milk-pail performances.

Promote cows that do not come up to the average yield of the herd. Give them a walk off the farm. Replace them with cows that can and do keep above the average yield.

Pedigree counts for much, but withoue individual merit it is not worth anything.

What a man wants to know about a cow, a hen, a man, or a firm is, does it deliver the goods? If it does not, no one has any use for it.

The cause of stringy milk is a certain kind of bacteria which gets into the milk after it is drawn from the cow.

When trouble with stringy milk arises, it is usually overcome by carefully cleaning the cow's udder before milking, washing the milker's hands, and thoroughly steaming the tinware, strainer cloths, cans, etc.

The sooner milk is cooled after being drawn the better it will keep.

It should be remembered that milk is a good medium in which disease germs can multiply. Hence the greatest possible care should be taken to protect the milk from dirt.

The potato plant, the tomato plant, and the tobacco plant are closely allied, belonging to the same family. One has its tubers developed, the other its fruit, and the third its leaves.

Are the Canadian farmers addicted to Mormonism? One of them writes to a newspaper:—"Sir, if you see any women who want to get married, send them this way. I want a wife myself and a good many more."

Liberal feeding is necessary to liberal production.

Nothing adds to the quanlity of milk and cream like cleanliness in the dairy.

The cow which gives the most milk will not always make the most butter.

Low ceilings in stables, byres, cattle-sheds, etc., are fruitful sources of ill-health.

In lung affections of all animals, plenty of fresh air should be allowed, the body being kept warm.

Beautiful cows are not those that appear best on canvas in pictures, but on the balance-sheet in hard cash.

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Poultry Notes.

The Moulting of Fowls.

The development of the plumage of our domestic fowls is not a subject that has engaged much attention from poultry raisers, outside of the experts and fanciers in this country. In America, however, where the industry is raised to a science, and where the agricultural colleges make a speciality of issuing instruction in all that appertains to poultry husbandry, an elaborate treatise has just been issued regarding the development and sequence of plumage, and the relation between moulting and egg production. The subject is dealt with in the pamphlet at too great a length to permit of reproduction in these columns, even for the benefit of enthusiasts. It, however, lends itself to considerable curtailments, and in that form may be commended to the perusal of the layman who barely knows one breed from another, and troubles little about feathers or the part played thereby in egg production.

While the first body-covering of a chick may or may not be called plumage, it is shed and replaced as if it were plumage. The method of moulting, however, is peculiar to the downy coat. The baby chick, when it comes from the shell, has pin feathers for flights; in two or three days it develops pin feathers that will become main tail feathers. The down grows longer, and, on certain areas of the body, develops shafts. Within a few days the shafts burst open, allowing the web of the feather to spread out, but the down often clings to the tip of the opened feather. The ragged appearance noticeable on two or three-weeks old chicks is due to this clinging of the down tips.

The first body feathers to appear are those at the throat, just above the crop. From this point a line of feathers extends down each side of the crop and breast. When this line begins to show, a tuft appears on each thigh, and a line down the spine. The feathered areas increase in size as the chicks grow older, so that at the age of four or five weeks they have grown together, and the healthy chick looks to be well feathered. The wings and back are covered, the feathers growing well up the back of the head, and the breast, with the exception of a small space over the crop, is protected. The rear of the body is covered by the flights, the feathers on the thighs, and a tuft near the rear of the keel-bone. The legs are encircled by a ring of feathers, just above the shank. In a word, the chick's body is protected by its feathers at every vital point.

It is not generally known whether the chick feathers grow larger with the chick's development, or whether they are replaced by new ones; therefore, experiments were made to determine this point. A number of chicks just from the incubator were leg-banded and their down stained. These chicks were inspected daily for several weeks, and as the feathers appeared an attempt was made to stain them also. The colour took well on the flights and tail feathers; not as well on the body feathers. The first feathers were stained black. At the age of eight weeks all the red feathers in tail and wings had been moulted, and at 13 weeks all the black feathers had been replaced by white ones. At the times mentioned the bodies were covered with pin feathers, but this does not prove that these feathers replaced others which had been shed. This sequence of moults corresponds very closely with the sequence of moults in young wild birds.

From 13 weeks to just before maturity (five to six months) the chicks were not observed to moult. They then shed all their feathers, and assumed a more mature garb, the pullets apparently getting their full plumage. They lost their chick voice, developed bright red combs, and to all appearances were about to begin to lay. The rotation of this moult was nearly the same as the rotation of feathering in chicks, the oldest feathers being shed first. The wing and tail feathers, which were first to appear on the chick, were, however, retained until the bird was well along in the moult, and in many cases were not all shed until after the body moult was completed. At the time of moulting the flights and tail feathers (which were the first to appear on the chick) were retained until the bird was well along in the moult, and in many cases were not all shed until after the body moult was completed. The time varied in different individuals, but these feathers were usually shed in pairs, one on each wing, or cor-

KOONOOWARRA POULTRY YARDS.

Barred Plymouth Rocks : Special Exhibition pen. Ckl, 1st and Sp. at Victoria P. & K. C. Show; 1st and Medal Essendon Show, Vic.; 1st and Sp. Adelaide P. & K. Club Show, 1911; Hens and Pullets, all winners, P. & K. C. Show, Adelaide, 1911. A limited number of settings only. £2 2s. per setting.; Good Utility, £1 1s.

Buff Orpingtons : Birds have won prizes whenever exhibited. Good sound color and healthy stock; also good winter layers and splendid birds for Export trade. 10s. 6d. and £1 1s. setting.

White Leghorns : My Roseworthy pen averaged 220 eggs per hen, and are now mated to cockerel of well-known laying strain. 7s. 6d. per setting.

White Plymouth Rocks : Snow-white birds, easy to breed and rear, typical Farmer's fowl, good Winter Layers and excellent Table Birds. A few settings only to spare at £1 1s.

White Orpingtons : Imported and prize-winning stock. Won 1st Ckl, 1st Pullet Royal Show, Adelaide, September, 1910. Great Winter Layers and good Table Birds. 10s. 6d. and £1 1s. setting.

Pekin Ducks : Never beaten in show pen. Four Firsts, 1 Second, 2 Sp' at P. & K. Club Show, Adelaide, 1911, out of five entries' Two Firsts, 1 Second and Special at Royal A. & H. Show, Adeleide, Sept' 1910, out of three entries. A limited number of Settings at £2 2s. Good Table Birds, specially mated, suitable for Export trade, 5s. per setting. Reduction for quantities.

Eggs securely packed and delivered on Rail or Coach (buyer pays carriage). All Eggs Stamped Koonoowarra. Infertiles replaced once.
Terms: Cash with Order. I keep nothing but A1 Stock. I cull heavily and breed only from the Best.

P. C. MANUEL, Enfield, S.A. Telephone: Central 273.

responding feathers on each side of the tail, as the case might be. The first tail feathers to be shed were usually the middle pair; the first wing feathers to be moulted were commonly the last primary or the first secondary on each wing, counting from the tip. The last feathers to be replaced were the ones on the inside of the wing just above the primaries and secondaries, a small tuft on the body just in front of the thigh and the flight coverts.

The pullets appeared to undergo this moult whether they laid or not. After the pullets began to lay they shed no more feathers so long as they continued in production. When they ceased to lay many of them began to moult. In some cases the moult was complete, extending to the flights and the tail; in others it went no further than the body feathers; while in others again it included only a few feathers on different parts of the body.

The number of eggs laid before moulting did not appear to influence the completeness of the moult. One pullet laid 30 eggs and moulted completely. Another laid one egg and moulted just as completely. Some of the pullets which were late in starting off to lay continued to lay throughout the winter and spring, not moulting until the following regular moulting season. One of these laid 230 eggs between moults, about 58 per cent. production for the entire time—13 months and six days.

The first mature moult comes at the end of the first year of laying. It seems to be a necessary renewal of the worn-out plumage, for feathers, like clothes, wear out. In the mature moult it was found that the rotation followed closely that of the prenuptial moult before egg-production commenced, the oldest feathers being shed first. The mature moult seldom began while the hen was laying. Quite a number of feathers might be shed earlier in the season and during production; but in most cases the shedding of feathers ceased for a week or two —often for a much longer period —and then the entire plumage was renewed. For convenience this latter part of the moult is termed the "general moult." During this moult some hens shed only a few feathers at a time in the different feather tracts, looking well clothed throughout the moult, while others shed almost the entire plumage at once. This quick shedding gave an opportunity for observing the feather tracts on a hen. The flight coverts (the small, stiff feathers on the finger of the wing) often persisted long after the other plumage was moulted. These feathers, which had been coloured, were observed on several hens many weeks after the moult, and were then apparently as firmly fixed as ever.

This treatise goes quite extensively into the details of an experiment of attempting to force a number of single-comb white Leghorns into early moult by a process of starvation. The conclusion arrived at was that it does not pay to force a moult by this method, and that it is better policy to encourage hens, by good care and feeding, to lay during late summer and autumn, rather than resort to any unusual means to stop laying in order to bring on an early moult. It does not pay, even when the object in view is to induce an early moult, with the hope of increasing productiveness during the winter season when eggs command high prices. It appears to be better policy for man to let a hen lay when it wants to, than to force it to lay when man wants it to.

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Poultry must have shade.

If no natural shelter is available, cut branches from trees and stand them up, tent fashion, in the yard.

When the leaves fall off, cover over branches with hessian or any light porous sacking.

How to get Winter Eggs.

Early-hatched eggs.

Strong, healthy, yearling hens.

Roomy, comfortable, well-ventilated houses.

Regular feeding of food rich in nitrogenous qualities.

Scratching-sheds and the fowls made to hunt for the grain among litter.

Each year breeding from the strongest and best layers and never in-breeding.

Using trap-nests or single pens by which the drones can be deducted, so as to give the room and feed to workers.

Never overfeeding, but given just as much as they will readily eat up clean and not waste or allow to sour.

Never exciting the hens, but rather keeping them tame, so that they have confidence in the feeder and do not become scary.

Keeping the houses perfectly clean and cheery, so that good health may be maintained and that lice may be discouraged in making their headquarters about the premises.

Never exposing the fowls to blustery weather, remembering that a cold, uncomfortable hen cannot be expected to be profitable. Therefore, the houses must be of generous size.

Never overcrowding the hens, for small families will do more work. It is better to keep fifteen hens in a house built for twenty-five than to crowd twenty-five in a space only large enough for fifteen.

If these warnings are carefully heeded there will be no difficulty in securing winter eggs. Hens have no particular laying season; they usually lay best in warm weather, because conditions are better.

TICK

South Australian poultry owners have found that the very best remedy for the TICK CURSE is

Faulding's

Phenytas.

Periodically dip the infested birds and spray infested houses and runs with Faulding's Phenytas and there will be no further fear of tick.

FAULDING'S PHENYTAS is Absolute DEATH TO THE TICK

Eggs: Their Composition and Growth.

The egg as produced by the fowl of to-day is one of Nature's marvels, and a few remarks on its composition will therefore be of interest to readers who have hitherto regarded them merely as a saleable product of the fowl. In calling the egg laid by the modern hen one of Nature's marvels, I do not, of course, mean that it has altered in any way from those laid by the primeval fowl, but that as its numbers have so greatly increased, 250-egg records having been here and there authenticated, while it is remarkable for a feathered fowl to lay twenty eggs in the year—the average of many wild fowl—the marvel is increased when the number is multiplied tenfold.

Every hen has two ovaries, but this is simply because Nature duplicates most organs of the body; one ovary always remains rudimentary, the other, the fertile one, almost always that on the left side, develops with the growth of the pullet. It is attached to the spine by a membrane. Here the egg starts its development, the essential parts of the germ and yolk springing from the ovary; at first no bigger than a pin's head, these rudimentary eggs grow and mature in due course. Each yolk is enclosed in a thin, transparent membrane. As the yolk grows the membrane or ovisac ruptures at the middle—that is, the thickest part—and the embyro egg, already enveloped in another membrane, passes into the oviduct or egg-passage. This is simply a tube which delivers, as it were, the complete egg at the other end. In the oviduct the fluid called the white, or albumen, envelopes it, layer by layer of it being taken up by the egg in its passage. Further on it receives the transparent skin or parchment-like looking covering which holds the complete egg apart from the shell. This skin is twofold, the two skins separating at the thick end of the egg, where the air-chamber is situated. Finally, before it reaches the end of its journey, the egg becomes coated with the shell, technically termed calcareous deposit, then passes into the cloaca and is ready to be laid—that is, expelled from the fowl.

So much for the growth of the egg from the microscopic germ, which can be seen in the ovary of the fowl, to the finished article in the nest. Now a few words on its composition, which is more complicated than many of us are aware of. Even the shell repays examination. How many poultry-keepers are aware that it is softening during the period of incubation? Yet this is so. The shell of the new-laid egg is formed of prismatic particles with pores in between (hence the reason why the egg absorbs odours so easily), and is so built that its strength is remarkable. Take an egg in the palm of your hands, and, exerting pressure on the two ends, try and break it; only a strong man can, and yet when boiled it yields to a tap of the egg-spoon. During incubation the heat and life inside the egg soften the shell, or, rather, render it more brittle, its particles being disintegrated by the heat. Were it not for this provision of Nature the chick would not have strength enough to break the shell and liberate itself.

The yolk is built in layers, surrounding the central portion, which contains the germ, and is called the blastoderm, germ-skin; this is best described as a disc about ⅛ of an inch across. All eggs, whether fertile or not, have this germ, and in both cases it looks alike, but under a microscope a difference will be detected. In a fertile germ there is an outer ring, whitish in colour, with a smaller clear part in the centre; in this clear part small white spots can be seen. In the unfertile egg the disc is whitish all over, with little clear spots irregularly distributed over it.

The white is also in layers. In a hard-boiled egg this is easily noticed, for the layers can be peeled off separately. These layers are of slightly different density; to the most dense layer two cords are attached, one on either side of the yolk. These are called the chalazæ; they are rather below the centre of the yolk, and are for the purpose of balancing it so that the germ always lies on top. However, the egg is turned, the germ, owing to these cords, keeps uppermost. The chief change that takes place in the egg as it becomes stale is the enlargement of the air-chamber. This is due to evaporation; under the influence of incubation the air-chamber grows and grows till it occupies about one-fifth of the whole. Incidentally, it should be added that at any stage piercing the shell over the air-chamber will prevent a successful hatch. When the egg is infertile, incubation —that is to say, heat—takes practically no effect upon it; but when the germ is fertile a few hours is sufficient to affect it. The germ enlarges, blood-vessels, exceedingly minute, appear radiating from it. By means of a magnifying glass, on the second or third day the eyes can be seen and beating of the heart, and on the fifth or sixth rudimentary legs and wings appear. The final marvel in connection with the egg is the hard tip to the beak, which appears when the chicken is far enough advanced to try and break the shell; its beak is then soft and tender, but the tip to the upper mandible is hard ,and this breaks the shell with very small expenditure of strength on the chicken's part. Once the chicken is out the tip is useless, and in a day or two drops off; its mission in life is over.

C.D.L.

Disposing of Surplus Stock.

Now that the season has arrived when the young stock must be carefully overhauled, and all birds that are not required disposed of to best advantage, a few remarks on the very important subject may not be out of place. Many poultry-keepers experience great difficulty in the disposal of young birds at prices which will allow a fair margin of profit, and it frequently happens that some have actually to be sold at a loss, largely owing to the fact that the majority of these surplus fowls are cockerels. All the best of these birds should be sold for stock purposes; and this should not prove difficult, providing they are really good ones, and judicious use is made of the advertising columns of the poultry press. Every breeder, however, has a number

"ONTARIO" WHITE LEGHORNS.

have twice won Roseworthy Egg-laying Competition.
World's Record for placing the first five pens in Blenheim Competition 1906-7, 100 pens competing.

I am offering eggs from Roseworthy winners at a very low figure to the first 20 applicants. This pen beat all Australasian Competitions held in open yards for 1908-9.

High class stock and eggs in season satisfaction guaranteed.
Telegrams—"Ontario."

T. B. BROOKS - - Clarendon.

of "wastrels"—birds which are unfit for breeding purposes—and which, therefore, cannot be sold for use as stock birds. The only way to dispose of these birds is to fatten them for the market, and this should be done long before they become full grown. It is a mistake to rear useless birds to maturity, for, leaving aside the fact that the increase in price obtained for full-grown fowls does not pay for the cost of the additional food consumed, they are taking up valuable ground, and requiring attention which would be bestowed to more advantage on the other birds. Hens which have reached the age of two years, and are no longer profitable, can generally be sold without difficulty for table purposes, providing the owner is prepared to accept the low prices which are invariably offered for such stock.

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How Much to Feed.

It is far better to under-feed than to over-feed poultry, and their owner must use his judgment as to the quantity to be given. By carefully watching the birds at feeding-time, it is very easy in a few days to determine how much they should have thrown to them, the right quantity being what they will eat with relish, and no more. Again, fowl's appetites vary and are influenced by the weather and other causes, as also by the health of the bird. A hen when laying will, and ought to, eat more than when not laying, and growing stock require most of all. The first feed in the morning which should always consist of soft food, must be given as soon as possible after the birds have got off the roost, and the evening meal, which should always be hard grain, immediately before they retire to roost.

G. L. MUELLER'S

Aromatic Schiedam Schnapps

G·L·M
TRADE MARK

This universal cordial is manufactured and bottled

IN SCHIEDAM (HOLLAND)

with special care and is warranted free from every injurious property and ingredient.

It is highly recommended by most of the hotelkeepers in the Commonwealth of Australasia.

Please take notice of the signature on the labels, and beware of inferior imitations.

Contains 84 per cent. Proof Spirit.

◆

Best Time to Kill Old Hens.

The best time to kill old hens or to sell them to dealers for killing, is just as they begin to moult, for they will not then have lost conditions. But if they are allowed to run for two or three weeks after the moult has set in, they become thin and scraggy and are of very little use for eating.

It is not always possible to know by the appearance of fowls as they run about the yard whether moulting has begun or not; but the signs, other than the actual casting of the feathers, by which a hen in moult may be recognised, are mopishness, loss of appetite, and paleness of head and comb. If the birds are examined while on the roost, those moulting can be detected, because their crops will be only half full, whilst hens which are in full lay, and have not begun to moult, will have full crops at roosting-time.

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Fattening Table Poultry.

There is a great art in successfully preparing table poultry for the market and in those establishments where the work is done thoroughly, on up-to-date lines money is undoubtedly made. Cramming on a small scale does not pay, and so it would be most misleading to advise beginners to treat their birds in this way. In the first place, two or three birds should be placed in close confinement. One alone would be liable to mope. The coop, pen, or box should, of course, allow of the birds moving about freely; it should be kept clean and be fairly warm. Some people at this stage keep the birds in the dark, but this we have not found at all necessary and, moreover, we think it cruel. Actually, the more comfortable (and therefore the happier) the birds are, the better, only they must not be able to take much exercise, for obvious reasons. It is a good plan to let the birds be really hungry before they have their first meal, as then they will take it readily; and birds, being creatures of habit, soon stop trying to get out of their prison, and settle down to wait for meal-times. Though often recommended, we have not found the plan of leaving a trough of soft food before the birds a good one, the better method being to give three or four heavy meals during the day. The more soft food the birds will eat the better, and for our purpose there is no food as good as oatmeal, while middlings and ground maize, milk, and fat may also be used. Birds will not stand this treatment for long, so that they should be closely watched, and be either killed or turned out again as soon as they show signs of "going off their food."—Exchange.

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Exposure of Hatching Eggs.

How long eggs will retain their vitality when exposed during the process of incubation is a matter that depends upon a variety of circumstances, such as the time of year, the period of incubation, etc. A certain butcher kept a few cross-bred fowls in and around his premises. One day last May a friend gave him a sitting of valuable duck's eggs, which were placed together with a broody hen in a lock-up pen, letting her out every morning. One morning he was unexpectedly called away on some business, while Mrs. Broody was at breakfast, and forgot all about her, with the result that the treasured duck's eggs remained uncovered all day. When the mistake was discovered he, of course, felt sure his visions of ducklings had disappeared for ever; but as a forlorn hope, he allowed the hen to return to them, and much to his surprise at the allotted time found himself the proud possessor of nine strong ducklings! Many similar instances could be cited where eggs have hatched successfully after long periods of exposure, giving possibly better results than many others, and it is questionable if many of us are not too careful in this matter, and both with hens and machines return the eggs to warmth when a considerable deal more airing would be beneficial.—Exchange.

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Keep the water in the coolest spot, and if you can change it two or three times a day, it will be much better.

A WELL-KNOWN RESIDENT OF ADELAIDE THE "CITY OF CHURCHES," WRITES OF CLEMENTS TONIC.

Speaks of the Broken Hill Mines, and how he lost his Health by Lead Poisoning.

Clements Tonic, Limited has published weekly in this and other Melbourne metropolitan newspapers striking letters in testimony of the great Powers of Clements Tonic in restoring health when recovery is despaired of. Miners and painters especially should read this gentleman's letter.

"Cor. Scott and Clyde streets
'Kensington, Sth. Australia,
"1st Sept., 1911.

CLEMENTS TONIC, LTD.

"Of all the mines in Australia I think the Broken Hill mines are the most injurious for the health of a miner, and it was whilst working there and suffering from an attack of Lead and Gas poisoning, that I first discovered the merits of your splendid Tonic. IT ACTED LIKE MAGIC IN MY CASE. When I was convalescent I used to feel too languid for anything; everything seemed a trouble to me, but after taking a couple of bottles of your famous medicine, I felt like a new man. I am well known in Broken Hill, having worked on the Central mines for ten years. GRATITUDE AND THE WELFARE OF MY FELLOW WORKMEN prompt me to pen this note, and ou are at liberty to make what use you like of it. I recommend your tonic everywhere.

"(Signed) EDWARD ELLIS.'

To keep the blood healthy use Clements Tonic, because by keeping the stomach in health it makes the blood rich. ALL CHEMISTS and STORES SELL IT EVERYWHERE. Get it, and get well. - 0

Eggs.

If an egg is held between the hands, the broad end in one palm and the pointed in another, and the utmost energy is exerted, it is impossible to break it, even though the hands be placed between the knees to gain more pressure. This remarkable strength is due to an egg's perfect arch, and so long as the pressure is from end to end, and not from side to side, the arch will withstand almost any weight. I have frequently thrown a new-laid egg high into the air, allowing it to fall upon a lawn, and while bouncing several inches, sometimes feet, from the ground the shell has not even been cracked. When we remember that the shell of an egg is perforated all over by a multitude of minutes holes, through which the embryo chicken breathes, this great strength is all the more remarkable. The nutritive qualities of an egg are well known, and require no emphasising.

A great diversity of opinion exists regarding the possibility of hatching two chickens from what is commonly termed "a double-yolked egg," and while I have never succeeded in accomplishing this, although I have tried very many times, there are several who claim that they have actually produced two chickens from one egg. The white of an egg is the part that goes to the formation of the chicken, not the yolk; the purpose of the latter is to supply nutriment to the chicken during the stages of development, and for the day or day and a half succeeding hatching. In all cases in which I succeeded in hatching a chicken from a double-yoked egg it was badly deformed. Either it had four legs, four wings, two heads, or two bodies, or else it possessed some other remarkable feature of a similar nature. As a rule, however, I have found a double-yoked egg to be sterile, and thus no amount of hatching would ever cause it to produce a chicken. Sometimes, on the other hand, eggs are laid that have no yolk at all, which are commonly called "cocks' eggs," and these, of course, are valueless for hatching. "It it sufficient," says Andouin, writing on this subject, "in order to comprehend this phenomenon to clearly depict to oneself the condition of the hen at the time of laying. The yolk forms, tears its envelopes, and falls into the oviduct. The white is secreted, moulded on the yolk, then secretion of the shell takes place in turn. We might fancy that secretion of the white is determined by the pressure of the yolk; but such is not the case—these phenomena are only united by time. When all the phenomena occur in the usual way the yolk arrives in the place where the secretion begins, but if the yolk is delayed or turned aside in its path, the white is no less produced; the shell, the envelope, and an egg without yolk are laid."

— Large Eggs. —

It is often urged by some writers on poultry matters that it is imperative if we are to secure the best returns from our hens to encourage them to lay very large eggs. But is it such a great advantage? I greatly doubt it. When hens are kept for producing eggs merely for home consumption, it is, of course, a matter to which small importance is attached, but when eggs are intended for marketing it is quite a different thing. So long as the eggs are of a fair size they fetch just as high prices as the larger ones. In a few instances, perhaps, where a private customer is being supplied, greater satisfaction and a higher price may be obtained by always sending very large eggs, but for ordinary purposes the medium-sized egg is the better. It stands to reason that a hen cannot produce as many large eggs as medium-sized ones in proportion to the amount of food consumed. In order to produce a large egg a hen requires more nutriment than to produce a smaller egg. All the nutriment contained in an egg is derived from the food eaten by the hen, and it will be readily seen that a hen laying large eggs requires more food than a hen laying smaller ones, provided both lay the same number. Where no difference in price is made between large and small eggs, a greater profit will be made on the sale of the medium-sized eggs, as less food has been required for their production. When the commonnsense plan is adopted in this country, as it has been in many places in Europe, of retailing eggs by weight it will be altogether another matter.

Eggs! Eggs!
Sittings from Heavy Laying
White Leghorns
Black Leghorns
Black Orpingtons
Silver Wyandottes
15 Eggs to each setting. Guaranteed fertile or replaced. 10/6 per setting.
T. E. YELLAND,
S.A. Farmers' Co-Op. Union, Ltd.

THE DIFFERENCE IS JUST THIS: WHEN YOU USE
Burford's Prize No. 1 Soap,
Burford's No. Starch,
Burford's Extract of Soap,
YOU SAVE YOUR MONEY.
WHEN YOU USE A SUBSTITUTE THE OTHER MAN SAVES YOUR MONEY.
DON'T LET HIM HAVE IT.

Skim-Milk For Poultry.

It is a source of wonderment to me that more farmers do not combine the dairy and poultry branches of farming when it may be done with so much profit. There is always a ready sale for good butter, generally considerably above the regular market price, and no one should be content to make an inferior article. Then there remains the skim milk and buttermilk, both of which may be used for poultry to the very best advantage. Great care must be taken to have this milk either sweet or sour, however, and all the time alike. It will never do to feed it sweet one day and sour the next. I have used it in both ways, but like the sweet the best, although it may be a little more trouble to have it so.

I have never found anything that will finish off table chickens as well as sweet skim-milk for a sole drink, with access to cracked grain at all times, and a warm mash five times a day, just what the chicks will eat clean in five minutes. I once made an average gain of three-quarters of a pound each on a lot of birds by this diet in two weeks' time thereby getting a very high price.

To test the value of skim-milk for laying hens, I put 60 pullets, equally divided, and as near of an age as possible, into two equally comfortable and sunny pens. I fed them exactly alike, keeping strict account of their feed, but gave different drinks. One pen had sweet skim-milk, while the other had plenty of clear water. This treatment was begun November 1, and accounts were balanced with both pens May 1 following. Those which drank the water had but little over half as much credit for eggs laid, while their feed had cost more than the pen which had the milk. Some days, in the very coldest weather, the milk-pen of 30 pullets laid 28 eggs, and their average for January was 24 eggs daily.

I have tried this repeatedly. But when I do not have a full supply of the milk for all of my pens, I prefer to feed certain ones all of the time, and not change about, or give part milk and part water. Remember that the drinking dishes must be kept perfectly clean and sweet, and the milk must be either sweet or sour day after day, never sweet and sour.—"American Agriculturist."

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Pale-yolked Eggs.

As a rule, pale yolks may be attributed to poor feeding, and although we do not go so far as to state that pale-coloured yolks are not so nourishing as rich-coloured ones, that theory has often been advanced, and supported by very sound arguments, whilst it is certain that the lack of colouring matter is displeasing to the consumer. In most cases improvement can quickly be effected when better food is given to the bird. We have seen hens that have been fed on barley alone, and have laid very pale-yolked eggs, much improved in this respect after a week's feeding on wheat and biscuit meal, with a little cooked meat and plenty of fresh green food. The green food is of great importance, for it seems to provide much colouring matter, and hens kept on a good grass run seldom lay eggs with pale yolks.—"Bazaar."

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Success or Failure.

The success or failure of the poultry business, probably to a larger extent than most other lines of work, depends on the close attention to the small details connected therewith. To the beginner, especially, does this appeal, as he realises after the first wave of enthusiasm begins to subside that the poultry business is not the avenue that leads to the palace of indolence, neither is it the "Aladdin's Lamp" which brings to the fortunate possessor every heart's desire, with no expenditure of labour in its attainment. Each success must come as the reward of earnest effort intelligently directed. However, in no direction is diligent and painstaking attention to the work in hand more sure of reward than in poultry-culture. The haphazard method of rearing poultry which was in vogue in the days of the scythe and cradle will not do as a companion of the improved machinery and intensive farming of to-day; nor can the owner of the mongrel hen, which must steal her living from the feed boxes of the horse and cow, or snatch a stray kernel of grain from the pigs' portion, while her shelter is left to her own choosing, expect to become the successful competitor of him who studies and supplies the varied needs of his feathered charges. Science and balanced rations seem to many a "goblin" that frightens farmers and debars closer study, instead of the beacon light that shall guide them into the harbour of success. Science, as applied to poultry culture, should be but another term for common sense, and balanced rations should have no more terrors for the poultryman than when called other names by the pig-raiser when he uses one feed for his growing young stock in order to lay the foundation in health and frame that he may later change his feeds and build up with fat on the foundation which largely by his intelligence in feeding he has previously laid; or the dairyman when he lays the foundation of one system of feeding for his future milk-producers, or by another combination of feeds he is able to produce prime beef. —"American Poultry Journal."

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Killing and Plucking.

Turkeys and fowls should be plucked and drawn as soon as killed. Killing is best done by dislocating the neck with a sharp pull, and the feathers are most easily removed while the bird is warm. In plucking turkeys the feathers are left on the head to half-way down the neck, and also those on the back just above the tail; in fowls and ducks the head and outer joints of the wings are not plucked if for sale. Ducklings are killed by cutting through the roof of the mouth to the brain with a sharp knife, and should be hung up till the blood drains off.

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Use floorless houses wherever possible, and move them as often as is practicable. Change their positions each day, or twice or thrice a week.

21 Poultry Papers for 1s.

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The Australian Hen

AND FANCIERS' FRIEND,

756 GEORGE ST., SYDNEY, N.S.W.

Success in Chicken Fattening.

By Edward Brown, F.L.S., in Reliable Poultry Journal.

It is necessary in connection with the fattening of poultry to understand the influence of food upon the system, because until we do this there is danger that mistakes will be made, or that the best results will not be obtained. In the first place the food must always be what is known as soft food, that is, meal prepared by mixture with some liquid into a proper consistency. The reason for this is that as the birds are kept in close confinement, and thus have only a very small amount of exercise, the organs of the body have less power than when the bird is running about in the usual manner. Hence it cannot digest the same class of food. The fattening system is an artificial one, it is undoubtedly a measure of forcing, and can only be carried out for a limited period ; in fact it is a system of ripening, which fact must never be forgotten.

The kind of food used must of course be carefully considered. It is possible to add greatly to the weight by feeding upon meals rich in carbo-hydrates, such as Indian meal, but the results are by no means satisfactory. The oily yellow fat added to the body by so doing is objectionable in appearance, and if the bird be roasted the greater part of it will disappear in the dripping tin. We do not want to add pure fat to the system beyond a certain degree.

— Foods used for Fattening. —

The foods chiefly employed for the purpose of fattening are ground oats in England, buckwheat in Belgium, buckwheat meal and barley meal in France. These are all suitable for the purpose, though the first place must undoubtedly be given to the ground oats, which contain nearly 6 per cent. of fat and a considerable amount of limey matter or phosphates, which go far to whiten the flesh, at the same time giving it a good flavour. Ground oats are almost exclusively employed in the south-eastern districts of England, and it is not too much to say that a great amount of the success achieved by the fatters there is due to the use of this material.

The preparation of ground oats is not so easy as might at first sight appear. Ground oats is not oatmeal, but oats ground up, husks and all, until they are as fine as powder. English and Scotch oats cannot be used for this purpose, as they are too thick in the husk and also contain too much moisture, and in Europe the small, hard, thin-skinned Russian oats are chiefly employed. The stones by which they are ground are run very low, and we mention these facts because many attempts have been made to produce ground oats from unsuitable grain. Ground oats is somewhat expensive, and hence many fatteners in England use a mixture consisting of 1 part ground oats, 1 part barley meal, and 1 part Indian meal, preferring for the latter white corn meal.

Buckwheat meal is not quite so good for the purpose, for whilst strong in carbo-hydrates it is rather low in albumenoids, and also in fat, and contains somewhat of an excess in woody fibre. It, however, can be considerably improved by the addition of other things, and the results in Belgium especially are very satisfactory, although we must acknowledge that Belgium birds have not such white flesh as seen upon our best English specimens. The buckwheat is ground up very fine, husks as well as the floury portions of the grain, and as it is rather sweet the birds are very fond of it.

In France both buckwheat meal and very fine sifted barley meal are employed. The latter is not as good as either the ground oats or the buckwheat meal in that it is somewhat stimulating. When well sifted, removing all traces of husk, it is more suitable for the purpose than if the husks were included. Certainly the results of feeding upon fine barley meal which we see in the best qualities of French fowls justify those who use it in their doing so. The color of the flesh on the La Brasse, La Fleche and other French fowls is whiter than our own, but we think that is probably due to other causes, more especially the quantity of milk employed and also the natural color of the birds.

— Sour Milk Essential. —

Whatever the kind of meal used for fattening, it must always be prepared to a proper consistency by mixing with milk. In England this is usually skim milk, and the same is employed to a large extent in certain districts of France, but in the La Bresse country the whey from the curds is also used in the same manner. In Belgium buttermilk is chiefly used. It will be seen that in all cases, whatever the form of the milk or moisture employed, it must be soured, and not sweet. Many people are surprised that skim milk is preferred, but this can be explained by the fact that the butter fat contained in whole milk is too expensive for the work, and at the same time is not required. In all operations it is desirable to utilize what might otherwise be a waste product, which is of course true of skim milk. The plan adopted is to allow the skim milk to stand until it has thoroughly soured, when it will be much better for the purpose than if sweet and less likely to cause sickness of the stomach. The acid generated in the soured milk stimulates the appetite. The great advantage of the milk over water is that it contains so much in the way of limey water or phosphates, which whitens the flesh as well as prevents trouble arising during the forcing system.

— Fat is also Fed. —

In addition to the milk, fat is usually mixed with the milk during the last week or ten days of the process. The object of this is to soften the flesh, and by distribution of the globules of fat through the tissues make it much more palatable as well as increasing it in quantity. For this purpose any pure fat can be employed. Large quantities come from abroad and is sold at a reasonable rate, or arrangements can be made with local butchers, pork butchers especially, to take their surplus fat, which should be clarified and run into tubs or barrels and so kept until required. The quantity used will depend upon the size of the birds, the older birds being able to assimilate more than the young ones. The fat given should be very small in quantity at first, but may be increased gradually until each fowl at the end will be receiving about half an ounce per day.

— Preparation of Food and Feeding it. —

The method of preparing the food is pretty much the same everywhere. The meal should be mixed with milk at least twelve hours before it is intended to be fed, and allowed to stand, during which time there will be a slight fermentation, and it is found that this helps the process materially. The consistency of the food will depend upon the system of feeding adopted. When the birds are being fed from troughs it should be stirred into as stiff a paste as possible. If hand feeding is intended, it would require to be even stiffer, otherwise the pellets could not be formed. To this end the best plan is to mix it as stiff as possible and allow it to stand, and before feeding work the food with a little more meal, so as to dry it up. When the funnel is used, then the food must be quite liquid, and probably the explanation of the fine quality of birds fed in this manner is due to the large amount of milk they consume. If the birds are to be fed by means of a cramming machine, then the food should be about the consistency of very thick cream, so that it will just run, and nothing more. It is hardly necessary to say that the food given should be good in quality, and while sowing is recommended the fermentation must not be allowed to proceed to an undue length, otherwise the chemical changes will alter it more than is desirable.

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Sitting a Hen.

A fairly successful method of mine has been with a closed box divided into six nests. In the bottom of each nest is placed a thin clover or grass sod turned grass side down. This sod nicely hollowed out and with very little straw on the earth and the roots of the grass, makes an ideal nest and gives the right moisture required by the eggs. How often have we noticed that the hen that stole her nest away in the hedge row where she would get drenched by the rain, invariably brought off the full complement of chicks. There were no infertile eggs nor any chicks too weak to break the shell.

After the hen has sat two nights on the nest, she may be well sulphured and placed on the eggs (after dark invariably) and the lid closed down. About mid-day is a good time to feed. When the lid is opened, any hens not coming off are lifted from the nest and placed near the food. In from 15 minutes to an hour the hens that have not found their way back to their eggs are caught and placed on the nest and the lid is closed down until the same time the next day.

The first time or two off to feed the hen should be watched and quietly worked, if possible, toward the new nest. She will rarely go astray after twice finding her way to her eggs though the nest may be quite strange to her.

By sitting three hens the same day the chicks may be given to two hens and the third reset.

Judge Your Fowls Honestly.

"Few men are able to judge their own birds." This was the statement made not long ago by an old experienced breeder and judge, to the writer. The occasion of its utterance was one that often happens. A disappointed exhibitor was condemning the awards of the judge because he had been left out and to use his own word, "robbed." The comment of the speaker as above was certainly pertinent to this case. In the great majority of cases the judge's award is both honest and fair; but many exhibitors do not see in that way.

The remark of the unprejudiced observer as given in the opening sentence of this article set the writer thinking and this article is the result. It will be generally agreed that a man ought to be able to judge his own birds intelligently. That many men are unable, and others unwilling to do this, will also be agreed by perhaps all experienced readers. The practical question is "Why are so many men unable to correctly judge their own birds?"

If a man is going to be able to judge his own birds, he must know what the standard requirements for that breed are. And so thoroughly must be know these, that there will be continually carried in his mind's eye, an ideal bird. By this ideal, he will determine the merits of any specimen actually before him. He will immediately see how nearly it approximates or departs from the ideal bird. True, the perfect bird may never be realized; but all birds must be considered good or bad in proportion to their conformity to the ideal.

But this is only a beginning. Knowing what is needed, he must apply his knowledge impartially to his birds. Many men we have known are not strictly honest with themselves or their birds. They have what is perhaps a natural preference for their own, and look on them with a partial eye. This is a weakness to which perhaps, we must all plead guilty to a greater or less degree. It is well enough to make the best of your birds; but never condone a weakness or lack that you know the judge in the show will condemn. Too often an owner of a bird good in some points will magnify these excellencies and have a "blind eye" to faults that will be the first thing about the bird to attract the judicial eye of the well trained expert judge in the show.

This is commonly seen in the matter of shape. Take a case in point. An exhibitor anxious to win, as all should. He buys a high priced hen to wear the blue ribbon at the forthcoming show. She is a Wyandotte. He praises her color, in fact almost glorifies it; but says nothing of her shape. The judge comes along the line of coops. The first thing that strikes him is her lack of true Wyandotte type and characteristics. In his mind she is a typical Plymouth Rock. Give her a single comb and she is "a good one." But she is not a Wyandotte, and is unplaced. Afterward (for this is an actual occurrence), the disappointed man who has paid ten times the actual worth of the bird, is complaining to his competitors of the partiality of the judge. One who did not win, says to him, "Why man, I knew that I had long-backed birds, but mine are not in it with yours. Look at her, she is too long for a Rock, and you want to win first on her as a Wyandotte."

Now, all the trouble with that man was that he had so magnified the color of the hen that he had lost sight entirely of the more important item of shape. He was neither fair to himself nor his bird. He is a fair sample of many. Remember, shape is the vital breed characteristic, while color is but the distinguishing badge of the variety.

The summary of our argument is this: Whatever your breed or variety may be, there is a recognised standard for you to work by. You should know the requirements of your breed from a careful painstaking study of this standard. Every bird you own either for breeding or exhibiting should be honestly and critically reviewed according to the ideal. Be thoroughly impartial. With a coldly critical eye pass on its merits and do not excuse its failings. Be as hard on your own as on your competitor's birds. And if thus you study, criticise, work and plan, there is no reason why you may not be as good a judge of your own birds as any other man. But failing in these important points, it will be true of you as of many others, and as suggested in the opening sentence, "few men are able to judge their own birds."

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See that there is a constant supply of fresh and cool drinking water. Place it in deep pans, and put them in the shade.

Pigeon Notes.

Victorian Notes.

(By G.J.M.)

Lovers of pigeons, dogs, and fowls alike in Victoria are lamenting the fact that the Williamstown Poultry, Dog, and Pigeon Society have had to disband owing to the fact that they are no longer able to get their show station—the drill-room at North Williamstown. We understand that their Young Bird Cup for Pigeons has been handed over to the North Suburban Society.

With Essendon and Prahran also out of the running pigeon men are not too well catered for over this side at present.

On Wednesday, February 7, the Victorian Pigeon Society held a special meeting to consider the question as to whether a member should be eligible to stand for the position of president two years in succession. After much discussion it was decided that a member might be re-elected any number of times in succession to the position. Mr. W. H. Baker has been president for several years

A few issues ago I hinted at the probable formation of a Fantail Club. This has now been brought into actual being, and I hear rumours of great things to be done at the approaching show season. At one show the members promise fully one hundred Fans!

It is to be hoped that they will be able to make good, as this would give a great impetus to pigeons generally, to say nothing of the beautiful variety in question.

Sydney Royal schedules are now to hand. It is a great pity that this event falls so early, as so many good birds are in full moult just when it comes on, and fanciers are afraid to enter. However, it always provides a good show, and we all wish the management the best of luck.

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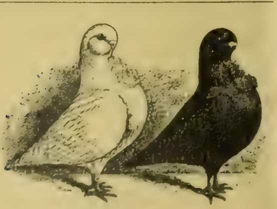

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The Use of Soft Food for Pigeons.

We are accustomed to the use of soft food for poultry—in fact, everyone who goes in for poultry-keeping uses this, both for adult poultry and also for chickens—but comparatively few pigeon fanciers either make use of or know of soft food as being beneficial to their pigeons. Most fanciers know how extremely difficult it is sometimes to get the parent birds to rear their young—how they seem to have a difficulty in some cases in supplying the young with food, and in other cases in getting them to take it. The writer has always found, during many years of experience, that an occasional meal of soft food is relished by the old birds, and helps to bring on the young if they do not seem to be thriving as well as they might thrive. By soft food, I mean food of the granulated biscuit type. It can be soaked with hot water, and may be given to the parent birds for a morning feed, so that they can go straight away and feed their young without any difficulty. Great care should be taken, in the first place, only to give the birds food that has been freshly scalded. Any that is left over should be thrown out at once to the poultry, for nothing would be more fatal than to give feeding pigeons food of this kind which had stood for several hours and had begun to ferment (these biscuit-meal foods will always begin to ferment after standing for a few hours); sourness like this would, of course, be fatal to the young birds, and even if it were not, it would probably upset the old ones to such an extent that they would be suffering from crop-sickness or something of this kind, which would take them off their ordinary course of feeding altogether, and so the young would die. Another point is that, for the birds to relish the food, it should not be made "sloppy." Use boiling water, and only use a small quantity of it; rather let the biscuit meal be steamed than soaked, just enough water being used to make it swell fully; then the birds will relish it, particularly if a small quantity of salt be sprinkled over it. Do not give too much salt, because if pigeons are not accustomed to that it will tend to upset them.

It is surprising how thoroughly pigeons which are kept in avaries, and are fed entirely upon hard grain, will relish this little variation of their diet. It also has this advantage, that when pigeons are feeding their young an occasional light meal of this character will encourage them to feed well, and the young will benefit accordingly. No doubt many of the readers of this journal have had experience in giving soft food to pigeons, and will be able to bear out the experience of the writer; but, for the benefit of those who have not had any such experience, I should say, try it with one or two pairs of feeders, and see whether you do not find that it is really an aid to success in the raising of squabs.—Exchange.

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Home Notes.

Food Value of Stone Fruits.

In general, all the stone fruits, when fresh, have a high water content. The different kinds do not differ very greatly in composition. The dried fruits contain less water and therefore have a higher food value than the fresh fruits. The fresh fruits contain a much smaller percentage of nutritive ingredients than white bread or dried beans. Judged by their composition they do not differ very greately from potatoes. It should be remembered, however, that the carbohydrates of potatoes consists almost entirely of starch. The carbohydrates of fruits consist largely of sugar and bodies whose food value is not well understood. It must not be forgotten, however, that fruits are valuable for other reasons than the nutrients which they furnish. They contain acids and other bodies which are believed by physiologists to have a beneficial effect on the system and doubtless very often stimulate the appetite for other food. They are also useful in counteracting a tendency to constipation. Another point—and one entirely apart from food value—should nat be overlooked. That is, fruit add very materianlly to the attactiveness of the diet. It is not easy to estimate their value from this standpoint, since often the appearance of food has a value which can not be measured.

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Home Hints.

Hot water or heat marks on varnished furniture can be removed by rubbing on a little oil, after which rub in spirits of wine. Polish with a pad of felt or cloth. Treat ink stains on furniture in the same way, rubbing in the spirits of wine with a soft large cork.

Oilcloths and linoleums should not be washed with hot soap suds. Wash them with tepid water and wipe with a cloth dampened in equal parts of cold milk and water.

Enamelled baths may be made to look like new by scouring with a paste of whitening and water. Wash off with hot water and polish with an old bath towel. For a zinc bath nothing is better than kerosine.

For lacquered brass goods dip a cut lemon in powdered whitening and rub in well. Rinse in soap suds and polish with an old silk handkerchief To remove burnt marks on pie-dishes, &c., scour with coarse salt rubbed on with a coarse damp towel.

Sponge jet trimming with alcohol and water.

To Fill Cracks.

Make a suitable quantity of thick, boiled flour and water paste. Have an armful of old paper torn into tiny scraps, and stir the paper into the paste until as thick as putty. Fill the cracks, smoothing nicely, and when dry the filling is as hard as papier mache. If preferred, gum arabic can be used instead of flour, in which case simmer the paper and water together and add a handful of gum arabic for each quart of the mixture. This must be filled into the cracks while warm, and takes paint as well as the boards.

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Oilskin Clothing.

The following is given as a satisfactory method:—Soak the material, which should be of strong, unbleached calico or brown holland, in hot water, and hang it out to dry. Take as much boiled oil as is necessary, and mix enough lampblack with it to blacken it. For yellow coats use ground yellow ochre instead. Then lay the fabric on a smooth surface, and put the oil on with a paint brush. Let the first coat dry before applying another. Lay the oil as thin as possible. A little gold size will make it dry quicker, say, half a pound to one gallon of oil. Three coats of oil are usually given. If the last coat remains sticky after it is dry, take 1 lb. shellac and simmer gently with two quarts of water, and when near boiling add a little liquor ammonia. If for a black coat add a little lampblack to it when cold, and apply it to the coat with a sponge.

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Bottling Fruits.

The fruit to be preserved must be gathered when it is dry, and handled with care so as to avoid bruising. If to be done on a small scale, time and labour are saved and the possibility of injury by bruising reduced to a minimum by placing the fruits as they are gathered from the tree into the bottles at once. The most convenient bottles are the cheap, wide-necked jam-bottles of one-quart capacity, and these can be purchased at about 1d. apiece. Before placing the fruits in the bottles the latter should be washed clean. It does not require much ingenuity to convey these empty bottles by means of trays, hand-barrows, or flat trucks to the orchard, and as the bottles are filled to the mouth with unbruised fruit they can be taken at once to the place where boiling water can be added. A large over is sometimes used, and serves the

purpose admirably. The bottles may be filled with clean, cold water and placed in the oven or on a stove and brought to boil; if boiling water in quantity is available the bottles may be filled up with this to save time. The fruit will reduce the temperature of the water after it has been added, so that the bottles must be placed where the whole of the contents can be raised to boiling-point. A kettle of boiling water should be used to fill the bottles to the brim before they are tied down with bladder or hermetically corked. It will be seen that the whole process consists simply of placing perfect, unbruised fruit in bottles, filling them so as to keep them air-tight. If a few drops of formatlin are added to the contents of the bottles before they are sealed it will serve as an additional prevention of decay. The bottles when filled should be kept in a cool, dark place. Thus treated the fruit will retain its form, colour, and flavour scarcely undiminished for a year or more. We have seen plums and apricots that have been in bottles nearly two years and are quite sound. Still more remarkable is the experiment made by one interested in the simplifying of fruit-preserving methods. Three years ago he placed some plums in glass bottles, filled them with pure cold water, added a few grains of permanganate of potash, sealed them down, and placed in an ordinary larder. These plums still look as fresh as if they had been grown this year.

The moral of all this is obvious. When Nature is kind and a big crop of fruit falls to our share, it is worse than waste to allow a large proportion of it to rot when its preservation may be accomplished at so little outlay. Plums in midwinter have a value, as most people know, and it is probable that inexpensive means of preserving large quantities of plums—in casks, for instance—could easily be devised. This, however, is a question for the market man; our object here is to call the attention of the proprietors of orchards in which fruit is grown chiefly for home consumption to this simple method of preserving fruits by means of bottles and hot water. Not only plums, but peaches, apricots, cherries, currants, gooseberries, mulberries, and blackberries can be treated as above directed.—"The Field."

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If you swallow a fish bone, a raw egg swallowed immediately after will detach it.

Tried Recipes.

— Apple Paste. —

Pare the apples and cut them small, weigh them, and allow an equal quantity of castor sugar. The apples must be put into cold water as they are pared. Put the apples into a jar and let them cook until quite soft. Boil the sugar to a syrup, then, throw in the apples, with a teacupful of marmalade and enough ground ginger to flavor. Let all simmer for ten minutes; wet the moulds with spirits, and fill them with the mixture. They will turn out firm and keep for years. The proper proportion of water used in making the syrup is a breakfast-cupful to one pound and a half of sugar.

— Apple Dowdy. —

One pound and a half of apples, slices of bread and butter, a little nutmeg, one gill of golden syrup, one gill of water, 2ozs. of brown sugar; well butter a pie dish, line the bottom of it with thin slices of bread and butter, peel, core and slice the apples, and nearly fill the dish with them, grate over them a dust of nutmeg, mix the syrup and water together, and pour them over the apples, put the sugar in a layer on top, then cover the whole with more slices of bread and butter; put a lid over the dish and bake in a moderate oven one and a half hours, turn on to a hot dish and serve it with sugar and cream.

— Apple Mould. —

Take six large apples, quarter pound of sugar, a little fresh lemon peel, six tablets gelatine, one cupful thick cream. Peel and core the apples, cut them up into about six pieces each, and put into a stewpan; add the sugar and the wineglassful of water. Stand them on the fire until well pulped, then pass them through a wire sieve. Make the puree very hot, and dissolve the gelatine in it. Now turn out into a basin, and when nearly cold add the cream, which must be whipped. Pour into a plain mould, and let it set. To turn out, dip the mould into a little hot water, and serve custard round the dish.

WANTED TO SELL.

INCUBATORS AND BROODERS, Simplex, awarded first price (silver medal) Adelaide Exhibition, 1910. Agent for Cort's Patent Cooler-safe, a boon in summer. Send for price list.—D. LANYON, Manufacturer, 46 North Terrace, Kent Town. 6-12.

— A Pretty Dish of Apples and Rice. —

Take 6ozs. rice, 1 quart milk, the rind of half a lemon, sugar to taste, half saltspoon of salt, 8 apples, ¼lb. sugar, ¼ pint water, ½ pint boiled custard. Flavor the milk with lemon rind by boiling them together for a few minutes, then take out the peel and put in the rice, with sufficient sugar to sweeten it nicely. Boil gently until the rice is quite soft; then let it cool. In the meantime, pare, quarter, and core the apples, and boil them until tender in a syrup made with sugar and water in the above proportions. When soft lift them out on a sieve to drain. Now put a middling sized gallipot in the centre of a dish; lay the rice all round till the top of the gallipot is reached. Smooth the rice with the back of a spoon, and stick the apples into it in rows, and set it in the oven to color the apples; then when required for the table remove the gallipot; garnish with preserved fruits, and pour in the middle sufficient custard to be level with the top of the rice, and serve hot.

— Steamed Apples with Cream. —

Pare nice apples: quarter or cut into smaller pieces if the apples are very large, taking care to have pieces as near the same size as possible. Put a white cloth in bottom of steamer. Lay in the apples as evenly as possible. Cover steamer tightly and steam until tender. Try with a silver fork, and when soft, remove, from fire, and arrange apples in as many sauce dishes as are needed, taking care not to break the pieces. Just before time to serve take 1 pint nice sweet cream, whip until light, add two tablespoons sugar and, if liked, half teaspoon vanilla extract. Put two tablespoons cream over each dish of apples and serve. This is a nice dish for supper.

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TO ADVERTISERS.—Alteration of advertisements should be in our hands not later than the 15th of the month.

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AGENTS.—Messrs. ATKINSON & CO. and MESSRS. GORDON & GOTCH, Ltd.

The Editor will be pleased to receive correspondence and answer questions. These replies will, for the most part, be sent by mail, unless received just prior to date of publication.

PUBLISHING DATE.—On the 25th of each month preceding title date.

DISCONTINUANCES.—Responsible subscribers will continue to receive this journal until we are notified by letter to discontinue, when all arrears must be paid.

Some Hints About Window Gardening.

Nothing gives a house a more cheerful and homelike appearance than well-tended flower boxes outside the windows; but many housewives with very limited means declare that they are unable to afford to keep their windows well supplied with flowers. Well filled window boxes certainly are an expensive luxury if the plants in them are bought from a florist and systematically neglected, so that they often have to be renewed; but if properly managed they need cost very little, and a few minutes' attention night and morning will keep them in excellent condition.

You can get much prettier effects [illegible] by planting the flowers in the boxes, instead of having them in pots and setting these in the boxes. Wooden boxes faced with virgin cork [illegible] bamboo are preferable to those faced with tiles. They should have [illegible] few small holes drilled in the bottom, and a thick layer of broken pieces of flower-pots to serve as drainage. Then fill the box to within an inch of the top with light potting soil: equal parts of ordinary garden soil and "road sweepings" well mixed, make an excellent compost for the purpose.

— The Secret of Success —

with a window garden is to mass your flowers and colours well. Do not have too many tints or varieties. Round the edge of the box plant a fringe of trailing ivy or creeping-jenny; ivy is the best, as in course of time it covers all the outside of the box, and looks fresh and green all the year round. A row of dwarf Fuschias, then a row of scarlet or pink ivy-leaf geraniums, and behind these a row of white marguerites, make a charming display. In between mignonette may be sown; this should be thinned out when the seeds begin to grow, and it will flower and smell sweet all the summer. A pretty effect is produced if the window is framed with diamond wire lattice, and giant nasturtiums and the profusely flowering canariensis planted at each end of the box and trained up the arch.

If an arch is impracticable, a wire cat-guard—costing from 1/, and invaluable for protecting lower windows from feline devastation—fixed at each end will look very pretty when the creepers have covered it, which they will do in an incredibly short time.

— The Flowers Must be Tended Regularly. —

every morning and evening. In hot, dusty weather they must be well watered at the roots, and also washed with the "rose" on the watering-can; but when there is a cold wind, or a suspicion of frost in the air, very little water must be given, and to the roots only, no moisture must be permitted to touch the leaves. In the morning the flowers must be carefully looked over, and every withered or withering flower and leaf snipped off; they weaken the plants if left on for a single day.

About once a fortnight a little weak manure water should be applied, and a small quantity of soot, a teaspoonful to one quart of water, applied to the roots only, not to the leaves, about once a week, will be beneficial to the geraniums and intensify the color of the blossoms.

For some inexplicable reason blindmakers charge an exorbitant price for outside blinds, but

— An Inexpensive Window Screen —

that will serve the purpose perfectly can be made in the following manner: —Get three-quarters of a yard of double-width striped blind linen; put a one-inch hem top and bottom, and insert in this one of the long bamboo canes sold for gardening purposes at 6d. the bundle. Cut a third cane in half, and screw a little brass ring to each end of the two pieces. Stitch one of these rings to the bottom corner of the blind, and sew two small curtain rings to the top corners. Then screw four brass hooks into the window-frame—two at the bottom, two above the highest flowers—and by means of the rings you can adjust your outside blind in half a minute.

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Plants Under Glass and Shade.

Cinerarias should be growing freely, and the strongest will require potting on before they become pot bound, that is if specimens are required; dipping in tobacco-water will have to be regularly attended to; do this as much as possible before re-potting, they will be more readily handled, and the loose soil will not fall out into the mixture so easily.

The Primulas (obconica varieties) will need clearing from dead flower stalks and foliage, and many will want a fresh pot a size or two larger than those they are in. I find one shift is quite sufficient for those that have keen kept over from last season; these plants will flower earlier, make larger plants, and be better for cut flowers than those of the present year's seedlings. There is not a sufficient number of these Primulas grown for decorative purposes and cut flowers; they are very useful, and do very well on a mixture of leaf soil and sand, with a little well-rotted cow manure.

Camellias, Rhododendrons, Azaleas, and Heath may be lifted from where they were plunged, the pots washed, and stood on the staging, if any, or on the ground, provided there is a hard and level surface; beware of standing them on wet clay. Some may require a little top-dressing with good peaty soil, with a little silver sand added, care being taken not to over-water at this time of the year, also of worms getting into the pots. Should their presence be noticed, the best, or, at any rate, a good remedy is stopping the hole in the bottom of the pot with a bit of moist clay, and watering with clear lime-water until the pot is saturated; the worms will all come to the surface. This is a better plan than knocking out the plants and trying to find the worms. Azaleas and Heaths have fine hair-like roots, and are sensitive of being disturbed.

Many of the Fuchsias that have finished flowering may be hardened off; this is done by giving less water, placing them in a more exposed situation, so that the wood may become firm prior to cutting back; do not treat them all alike. To have a continuance of bloom one requires several batches of plants in different stages of growth; there are several winter flowering Fuchsias which well deserve a place in every collection of plants, notably the Corymbiflorum type,, which are easily managed, but unfortunately rarely seen. Any clearing up or painting may now be done with advantage at this season, also alterations effected; when shifting any pots, &c., keep a sharp lookout for slugs, snails, &c., and apply a good dusting of new slaked lime; this, although the pests are not visible, will act as a preventive.

THE GREENHOUSE.

With this month we usually experience uncertain weather, and quite a number of plants will have to be returned to the stovehouse, keeping the house warm by early closing the ventilators; their stay in the Greenhouse may be prolonged, but it is preferable to shift the more delicate ones to warmer quarters at once, and so avoid all risks.

A number of Zonale Pelargoniums that have become leggy may be removed, and younger and sturdier plants substituted; these, with a judicious selection, will keep up a good supply of color, and during winter will last a long time in bloom, especially if the water is kept from the trusses; it is always best to have a lot of these plants on hand and coming along; by this mode a continuous blaze of colors may be secured during winter, after the Chrysanthemums have done flowering, and other blooming plants are scarce.

Towards the middle of the month space should be found for Chrysanthemums. These will require plenty of room, and should be by no means crowded; it will be far better to have a less number than crowd. Mildew (with wet and dull days) may appear; those affected should be dusted with flour of sulphur at once.

All ferns should be carefully looked over, and all dead fronds removed. Many will begin to show a brown tinge on the foliage, showing a sign of going to rest; these should not be watered so freely as the healthy green foliaged plants. Nearly all Ferns require a certain amount of rest, and the inexperienced gardener may imagine that they are dying, but this will not be so; rest is needed.

On many days, from this month till the end of winter, shading will scarcely be needed. The blinds may be relied on, so that the house will not need another whitewashing.

Some potting will be needed, as many plants will require larger pots, or perhaps shaking out and re-potting in smaller-sized pots. All this must be noted. It would not be a mistake if any old or unsightly Asparagus plants were divided and potted in useful-sized pots. Although these do not make such nice useful specimens as seedlings they are always in demand, and one cannot have too many of them.

Should any of the Caladiums be still in the greenhouse, remove them to the stove and as they drop their foliage gradually reduce the amount of water until they have finally gone into a dormant condition.

All watering should be attended to with great care, and plants not watered indiscriminately, but gone through carefully.

STOVEHOUSE.

Fire heat will be requisite in the stove during this month, at least at nights, and most of the plants must be kept healthy and growing. Many plants may be now rooted for further stock. Notably many Gloxinias may be propagated now where the varieties are desired to be perpetuated. This can be done by the foliage, either using a single leaf or a leaf pegged down on silver sand after severing the principal veins.

The foliage Begonias may be multiplied in a similar manner, and will make very useful plants by next season. Pot off any seedling plants that require it, also cuttings that have taken root, bearing in memory that the

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young plants will always make the best specimens, that is, in most cases. Should any of the Caladiums have been divided, keep those growing so as to get bulbs or tubers as large and strong as possible.

If the foliage of any has fallen keep the pots dust dry, and place under the staging free from drip; this treatment is applicable to the older plants; great care must be taken that they get no moisture. Some growers knock them out, and store in dry sand in a warm corner of the stove, or on a shelf. In any case almost everyone loses some tubers with all their care, and these are generally the best varieties. Many of the young ferns will need shifting into larger pots, and will keep green through winter.

Coleus.—A great many gardeners annually lose a number of their best Coleus. I find the best way to keep these is in the following manner:—When winter is fairly arrived, and most of the old plants are past their best I take a few cuttings of each variety and put them in 5 or 6-inch pots (select clean cuttings free from mealy bug); these when rooted are wintered on a shelf close to the glass; in the stove, a hanging shelf will answer the purpose admirably, by this means a few good cuttings (the tops) are secured in early spring. If this trouble is not desirable, the gardener can secure a good collection from a nurseryman every season, but sometimes they are rather difficult to procure.

Insect pests must be well looked after, and watering carefully attended to.

PITS AND FRAMES.

A great number of plants will need potting on. The strongest cuttings of Pelargoniums (Show and Regal) which have rooted, and are intended to grow on for specimens, should be selected, and, if possible, be given a little extra care. When in, say, 5-inch pots, and established, the points should be taken out to induce as many breaks as possible; about four would answer the purpose for the first season's flowers.

A few additional plants of Cyclamens may be potted, also any seedlings that are sufficiently strong. Pansies, Carnations, Pinks, Daisies, Polyanthus, &c., may be pricked out in boxes. Petunias may be potted on.

Chrysanthemums.—During the early part of this month the final staking must be attended to. Do not be sparing in regard to the water supply at any time, and manure water in particular. I give liquid manure water up to the time the flowers are partially expanded but the liquid manure is weaker. After staking, remove to a shelter of some kind, either a conservatory, calico shadehouse, verandah, or balcony, but they must be kept free from rain and drip. A top dressing of rich soil will aid them in developing their flowers.

Keep all pits and frames clean and well looked after, pots neatly stacked away, and all potting soils free from weeds.

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Open Border Notes for April.

This month will be a busy one with the gardener, and with digging, manuring, hoeing, planting, and propagating he will find he has as much to do as he can cenveniently manage.

New gardens can now be laid out, and in preparing a design, remember that curved walks are always much more pleasing to the eye than straight ones. Of course, this only applies to the flower garden. In the kitchen garden, long, oblong beds, separated by narrow paths, give more bed area, and are much more easily worked.

It is not advisable to have a straight walk from the road or street, but by means of a curved one, and judiciously planted shrubs, it is surprising what very pleasing effects can be obtained.

When the beds have been laid out, trenched, or dug, and well manured with old rotted cow dung, mark the position of the shrubs and trees it is intended to plant, taking especial care to plant the taller-growing kinds at the back or centre of a bed and the shorter in front.

Too much care cannot be taken in the choice of the shrubs to be planted, as they remain permanently in the places where they are first put.

Rose enthusiasts must get their ground ready for the new kinds they intend putting in this season. The soil, of course, if not trenched, must be deeply dug, and well manured. It is an oft-discussed point, which is the best to grow—standard or dwarf Roses, but to my mind the plants worked on a stock two or three inches above the ground are infinitely the best. With the standard there is a great expanse of unprotected stem, and it stands to reason that the hot sunshine of our summer must have a very bad effect upon it.

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When the young plants are received from the nursery they should be pruned, and occasionally pruned throughout the year, cutting out all weak or stunted growth, and removing all water shoots.

Roses are often attacked by the aphis, which sometimes completely covers the young shoots. I have found Gishurst's compound very effec-

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tual in removing this pest, making the solution slightly weaker than directed by the manufacturer.

Most Roses can be propagated by means of cuttings. Choose a shady corner, and prepare the soil by digging deeply and finely. Water the bed well, and let it be for a day or so until it is moderately dry again. In preparing the cuttings, cut them into six-inch lengths, making the bottom cut straight across and just below a bud. Remove all leaves except those belonging to the top bud, and expose as little as possible to the sun and air. They may be kept fresh until wanted by covering them with a little damp straw or grasses as they are prepared. When a sufficient number are ready, open a small trench with a small spade at the end of the border. Chop the side of the trench furthest from you straight down, and place the cuttings about 3 or 4 in. apart against the side, and then fill in the soil, taking care to press it firmly around the bottom of each cutting. This is really the most important part in the planting of "slips," as all air must be excluded from the bottom of cutting where the roots are formed. Mark by means of a label the different kinds that have been planted. If a little sand can be placed in the bottom of the trench so much the better.

Continue sowing hardy annuals, such as Bartonia, Candytuft, Stock, Dianthus, Mignonette, Lobelia, Salpiglossis, Linana, Linum, Calliopsis, Malope, Sweet Peas, Clarkia, Virginia Stock, Larkspur, Godetia, &c., &c. Also hardy perentials, as Iberis, Carnation, Canterbury Bells, Pansy, Antirrhinum, Aquilegia, &c., &c. That very pretty annual, Salpiglossis, is easy of culture, thriving in almost any soil, but doing best in a rich, light loam. The flowers, which are funnel-shaped, are curiously pencilled and marbled. They produce a very fine effect when planted in beds by themselves. Petunia superbissima is magnificent, some specimens measuring 3 and 4 in. across. This seed should be put in now. Plant in a seed pan or box, water very lightly, and cover pan with glass and paper until seed has germinated. When the seedlings have four leaves transplant into thumb pots, and when large enough, into open border. Great care and trouble is needed to protect them from the snails and slugs.

A. F. TELFER.

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Plant bulbs of all kinds this month. In a small garden, where room is limited, it is always advisable only to plant the best of the bulbs, such as Snowflakes, Anemones, Daffodils, Freesias, Gladiolus, Hyancinths, Ixias, Iris, and Ranunculus (both Turban and Perisan).

Grasses.—Ornamental grasses are a necessity in gardens where the flowers are used in making up bouquets. One of the best for this purpose is Panicum capillare, which, although only an annual, should be seen in every garden. It has very fine branching, hair-like flower spikes, and is one of the most delicate and exquisite of all the ornamental grasses. A border made of this grass is very effective, especially if some bright colored flower, such as Sturt's Pea, be planted in the centre of the bed.

Himalaya Fairy Grass and Purple Fountain Grass produce flower spikes that are extremely useful in decoration. Besides these, others worth growing are Melica Papilionacea, Festuca Rigida, Pennisetum Longistylum, and Stipa Pennata.

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Riverside Nursery.

Mr. H. Wicks and his nursery are much too well known to the readers of the Garden and Field to need any introduction, so we merely draw attention to the fact that his usual season's advertisement will be found in the issue. It is now some years since Mr. Wicks found that his rapidly growing business necessitated a large extension to his Payneham property—this he secured at Balhannah which is now grown into a large well arranged and most complete nursery. At either place visits of inspection are welcomed, when buyers may select their own stock, or they may with the utmost confidence place the selection in Mr. Wicks hands. As an amateur fruit grower said to us the other day "What I like about Wicks is that he appears to take a personal interest and pleasure in giving you exactly what is suited for your requirements." It would be difficult to imagine higher commendation.

◆

Chrysanthemum Show.

The S.A. Horticultural and Floricultural Show will this year be held on the 25th April at the Exhibition Building. From the schedule to hand we find that the committee has arranged for an attractive exhibition. In addition to a liberal classification for 'Mums there are a large number of classes provided for—Roses, Carnations, Dahlias, etc. There will be the usual display of Bouquets, Sprays, etc., and the classes for fruit, though they are not as a rule large, will, no doubt, make up an interesting section. As usual, a considerable number of special prizes and trophies are being offered. A special feature of the show will be the Decorated Dinner Tables (open to all-comers,) for which liberal prizes are offered. Full particulars will be found on the prize lists, which are procurable from all seedsmen, or Mr. W. N. Twiss, secretary, Bowman's Buildings.

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The little garden where the children are allowed to have a plot of their own affords one of the most innocent delights of childhood. The planting, the weeding, the watching for the first blossom, keep the whole family interested, and is the most thoroughly natural and healthful pleasure a child can have.

There is in all this a sense of ownership which is as unselfish as possession can be, for connected with it is usually the desire to give away the first fruits as an offering to friendship or charity.

The flower lover is almost always the flower giver, and nothing is sweeter than to see a dear child bring to the fond mother the first blossom from "my own garden." The best and surest way to shut out evil thoughts is to furnish themes for good and pure and beautiful thoughts. We cannot overestimate the real value of flower culture for children.

◆

An Up-to-date Establishment.

Although it was possible in the early days of the State to carry on agricultural operations with crude implements and still make a success of the business, things are very different nowadays, and the farmer who desires to hold his own during these times of keen competition must not only be alert and up-to-date himself but be equipped with the latest and best machinery. The establishment of Mr. H. Dennis, of Young Street, Adelaide (between Franklin and Waymouth Streets, and late of Morgan), is replete with all the latest implement-making machinery, thus being abl? to keep abreast of the times. Mr. Dennis' implements are now in very general use throughout the State, and though the test of time has subjected them to severe trials they have always proved equal to the emergency, thus gaining the highest reputation for satisfactory results in all classes of work. Amongst the numerous implements manufactured by Mr. Dennis the following may be mentioned as specialities :—Dennis' Patent Steel Buckscraper and Silt Scoops, Gates, etc. Farmers desirous of securing an illustrated catalogue can obtain a copy by sending a post card to the above address.

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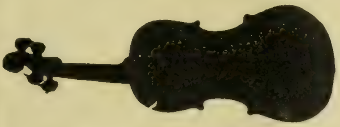

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A Garden of Sweet-Scented Flowers.

From "The English Garden."

"Let him who hath two loaves of bread sell one and buy flowers of the Narcissus, for bread is food for the body, but Narcissus is food for the soul."

How passing strange it is that so great a part of the charm and joy of gardens depends on the Invisible. One is apt to forget this, for grace of form and beauty of colour are so interwoven in our minds with the idea of gardens that we fail to recognise the part which is played in them by that which we see not; yet there is something which pervades and permeates and makes an atmosphere about them that is far more strange and subtle, far more spiritual and penetrating than any of their tangible and visible delights—it is the gift of scent.

Priceless is this gift, yet nowadays by no means so appreciated as it might be. The added grace of perfume to any plant is accepted and enjoyed, but no special effort is made to procure or to retain it. "Exquisite bodies that have no souls" is a description that might apply to many of the flowers that are found adorable to-day. Some Roses, for instance, magnificent, but scentless; Chrysanthemums, coaxed to grow to such outlandish sizes that they have no strength left for fragrance; Orchids, most modern of all flowers, which have no perfume of their very own, but borrow, as it were, the scent of others; Dahlias, glowing, brilliant, as living flowers of the sea; and a host beside. Far too many scentless flowers are now the fashion.

Still, there are some among us who, half weary of mere beauty, turn gladly to the homely sweet-smelling plants of the old-world garden, where blow the Cabbage and the Moss Rose, the delicious Clove, the perfumed Pink, the gentle Musk, the Honeysuckle and fragrant Jasmine. But many of our sweetest flowers are less good looking than those we have mentioned, and only a few of them are of much use in making a display, so, as most of us are bent on having gardens that are pictorial, it comes to pass that the sweet, homely plants get crowded out; there is even danger that in course of time a good many of them may be forgotten.

Another reason why a garden of sweet-scented flowers is now so seldom seen may be because the making of such a garden presents no dufficulties, but difficulties are what the modern gardener most enjoys. Anyone may possess a good collection of fragrant flowers if only he has a mind to do so, but just because there are no dear, delightful obstacles to encounter, no large sums to be expended, no ideas of startling the world with something hitherto undreamed of, the thing is left undone. All is too straightforward to be interesting, or rather too straight-backward for to furnish such a garden as the one we are thinking of means a good deal of dipping into the past. Among the hundreds of gardens where scent is enjoyed as a side issue one can only recall one, or at most two, where it is made a special feature of.

— Scented Flowers of Winter. —

There is absolutely no time of the year when the English garden need be scentless. A good many late December and early January blossoms are sweet enough to prove the sun has more power in the short days than we imagined. The creeping Winter Heliotrope,) the wall-loving Winter Sweet and silken sky blue blossoms of Iris stylosa make a nosegay that could hardly be more fragrant if made of summer flowers, and all are hardy, belonging to the open garden and the open air. With them we may gather mid-winter Violets. There are many scented leaves, too, that will yield their perfume if we ask them. Myrtle, Sweet Bay, Rosemary, Santolina or Lavender Cotton and many perennial and fragrant herbs. The permanency of leaf odours is a strong reason for growing as many sweet-leaved plants and shrubs as possible. In winter, more especially, we are grateful to the scented leaf.

— Fragrant Flowers of Spring. —

Violets and Primroses seem like children of one family, so much do they grow together. They are the very first flowers one thinks of in the fresh and happy spring-time. How utterly delicious the smell of a freshly-gathered bunch of Primroses, how soft, how cool, how clean; and before these, the dear little Crocuses and Snowdrops, not with strong scents but with fragrances that are just individual enough to know them by. Is it not the individuality of a flower that most endears it to us? The Violets, for example; you enter a room where there is but one, hidden away, perhaps, where you cannot see it; but who can mistake the dear little tune it sings? It is distinctive as the note of a robin and lovable for the same reasons, for its familiarity, unchengeableness and the pathos of old association.

Wallflowers, Hyacinths and the Poet's Narcissus.—All these spring flowers have exquisite fragrances, and each one is entirely different from the other. A little later on and flowering trees and shrubs will be shedding yet new perfumes on the air; Lilacs best of all, perhaps. Walter Whitman thought so, anyhow, but some would choose Syringa (so-called), Apple blossom, Lime tree blossom, Almond, Acacia or the budding Larch. We do not put the scents in order as they come, but as remembrance conjures them. Of sweet-smelling shrubs among the most delectable is the old-fashioned red Ribes, with its strong Black Currant smell and taste, so pungent, so irresistible, that one cannot pass without rifling the bush of just one leaf to play with.

— Scented Flowers of Summer and Autumn. —

Quite different in quality from flowers of spring are these. Roses, of course, come first, for they give us both scent and beauty as a rule, with equal generosity. Everyone loves Roses, and no one needs to be reminded of them, but there are fragrant annuals that are sadly neglected. Numbers of people omit sweet white Alyssum when they are making out their seed lists. It is sweet as honey, smelling very much like it, and goes on blooming till November. Stocks, Mignonette, Sweet Peas, Sweet Sultan and Sweet Scabious are in fairly common use; not so the aromatic herbs, however, many of which are well worth growing for their perfumes, either sweet or aromatic. Woodruff is a plant that might oftpner be given a place, for the sake of the new-mown-hay-scented foliage that so prettily 'sets off)its starry white flowers. And in early summer who can have too many beds of Lillies of the Valley or too many clumps of damask and pink Carnations, of the common Pinks, Heliotrope, Sweet Williams, Woodbines, clustering white Clematis, Southernwood, Lavender, Cottage Lilies, Day Lilies, Meadow-sweet, Sweet Cicely, Heart's-ease, Musk and best of all as regards fragrance the Lemon Verbena? All the sweet-leaved Pelargoniums, too, so out of fashion now, that we must never forget to take our own cuttings, for florists seldom keep them. Magnolia should

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have a west wall and Rosemary a south one. Honeysuckle and Jasmines should wreath the windows, intermixed with climbing Roses. Then when the summer wind blows in there will be scented draughts. What more delightful?

— The Garden of Sweet-scented Flowers at Night. —

The hot day over and the western sun gone down, how happy then the flowers of night—moon-flowers, as some have called them. At dusk the Invisible must hold sway. We wander down the shadowy garden paths and cross the dim and fragrant lawns. All the dumb flowers have now found voices. The Evening Primrose opens out, the double white Rocket remembers his old meessage, and the Night-scented Stock says gently, "I am here!" Honeysuckles breathe out a richer fragrance and hawk-moths quaff deeply from their delicate drinking-horns; Nicotianas (please keep to the white ones) pour forth heavenly scent that does not in the least suggest Tobacco. Some of us have built castles in the air about having a special garden all of night-scented flowers; the Night-blooming scented Cactus is enough to tempt anybody, but really it is better that we should dot the flowers about in careless fashion and let them take us by surprise, like children who hide their treasures and then forget them on purpose, to have the pleasure of finding them again.

— The Heathfulness of the Scented Garden. —

Floral and leaf odours are antiseptic, the essential oils of Rosemary, Lavender and Eucalyptus being among the most efficient. Perfumes made from flowers possess special health value. Why not scent cures? To smell Sweet Rriar, they say, makes anybody cheerful. The perfume of a Rose will often take away a headache, and any scent in which Rose is the principal ingredient is highly tonic and invigorating. Lavender has similar refreshing qualities, and flowers of delicate perfumes soothe the nerves of invalids. "A Rose garden is no place for grief," said Sadi of old.—Frances A. Bardswell.

A. G. TOYNE

Practical Saddle, Harness and Collar Maker and Repairer . . .

wishes to notify the public that he has removed from 20 Franklin Street to

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and respectfully solicits the continuance of your patronage. All kinds of New and Second-hand SADDLERY. Harness and Stable Requisites stocked.

All Orders promptly attended to. Repairs a Speciality. Old Harness taken as part payment for New, and full value allowed. All work guaranteed and the most reasonable prices charged. Price-list free on application. Buy direct from the Maker.

Ornamentals.

A paper prepared for the Nebraska Horticultural Society, by C. S. Harrison, York, Neb.

God loves the ornamental, for He has given the world and the whole universe so much of it. Infinite skill, art and taste have been lavished on our grand old earth. It swings through the heavens like a bride adorned with a wealth of grandeur and beauty. He paints on the gates of the morning those dissolving tints which vanish in to light. At evening, moving mountains of earth's choicest gems in their mingled beauty escort the retiring day. How glorious the night when the great dome, frescoed with blue, is sprinkled with stars, making a scene so resplendent it touches the soul, giving a divine awaking and enlargement—showing that it is related to the infinite. What august sublimity crowns the mountain—the coronal of white upon the hoary brow, the play of shadow and light, the blue above where float the fleecy clouds, all give us inspiration. When you let God alone and do not mar His works, what a beautiful land he gives us.

Before the white man touched our shores, He spread out a panorama of resplendent loveliness. There were vast forests of majestic trees, great rivers fed by unfailing streams were flowing to the sea, sparkling brooks were dancing gaily in the sunlight, charming lakes fringed with verdure and flowers were flashing their beauty like diamonds on the bosom of the fair mother earth, stretching out to the distant horizons were vast prairies whose emerald green melted into the sapphire of the sky, and there were flowers, flowers everywhere. God loved them so He filled the world with them all the way from the sunny tropics to the vast tundras of the Arctic. He makes winter glorious. In the cold North, at evening time, there is the most gorgeous display of which we can have any conception, when the curtains of the Aurora Borealis, flashing as with the coloring of the most sparkling gems, burn and glow, vanish and come again, lighting up all the clear heavens with entrancing splendors as if great moving pictures from the very heavens were controlled by the unseen hands of angels.

When it comes to fruits, God might have given them the sombre color of the cobble-stones—but no. One of the finest pictures on earth, the orchard in autumn with its great luscious burdens strapped up in envelopes of red and gold. The cherry tree is made beautiful—a bouquet of white in early spring and later you see the mingling of the red with the green—one of nature's fairest pictures. The strawberry, God's climax, is more valuable because of its superlative beauty. Fruits are not ready for delivery until they have their wrappings done up in colorings no artist can reproduce.

How endless the varieties of the trees with their different forms and foliage. Sometimes there are those of golden and purple tints, contrasting so well with the green of others. Then in the autumn, forest and mountain are vast foliage gardens—nature holding a carnival of color before entering, the solemn lent of winter.

What a family of shrubs He has given us. One hundred and fifty kinds of lilacs, with the power to produce more till we may run them into the thousand. These stretch the time of blooming from early spring till the first of July. In the West, we have not the full assortment of shrubs for our trying climate which they have in the moister and milder climate of the East, and yet, we have the power and skill for producing more. Our own "Wizard of the North," Professor Hansen, has brought out of the unknown a cross of Prumus Pissardi and Besseyii, one of the most beautiful shrubs I ever saw, symmetrical in form, with foliage of deepest crimson purple. Back in the unknown land there are other forms of loveliness which we trust his skill will drag forth to light.

The charming family of the Philadelphus or Syringas is a numerous one, and new types are being constantly added; so with the spireas and there are the viburnums and other shrubs which are all the while being improved.

When we come to flowers, we are in a land filled with the very fascinations and astonishments of loveliness. The rose, the peony, the phlox, the canna, and the dahlia with hosts of perennials show the love of the beautiful on the part of the Creator. But this is not all; the native flowers are but the beginning of things. They are mostly single. He gives man the skill to make them double and to increase their beauty manifold. There is kindly Nature, daughter of God, her head white with the snows of the millenniums, and yet, on her tresses are the glintings of the sunlight of eternal youth with each recurrent spring time. She is ever old and ever young, and yet, into the inner temple of her Holy of Holies, she permits us to go where she opens before us new pages of mystery and permits us to work miracles with her. What stupendous changes have been made with the phlox, the peony, the dahlia, and carnation, so marked, so divergent from the parent source their own mother would not know them. Yes, back in that unknown are reserves of beauty human eye hath not yet seen, waiting to be revealed so that the things we have already seen are only prophetic of further revelation.

Such men as Burbank, Hansen, Patten, and many others are high priests of Nature, commissioned of God to carry out his plans as well as the Gospel minister, the statesman, and the patriot.

The world's unused capital of the useful and beautiful is something stu-

J. T. TUNBRIDGE.

Vienna Dining Rooms.

HINDLEY STREET, ADELAIDE.

Opposite Ware's Exchange

GIVE HIM A CALL

pendous. Providence stands at the door and knocks, In His arms are not only spiritual gifts but also material blessings of amazing value. One hundred and fifty years ago, there were undiscovered continents of power—steam, oil, and electricity—all unused. The most potent sources of corporate wealth are from these recently acquired materials. God helps men and women to invade the undiscovered continents of beauty and uncover riches greater than those of Golconda.

When a carnation sells for 30,000 dollars, and that is but its beginning, when a Festiva Maxima grows to be worth 100,000, when other floral gems reach such high value, then it pays to explore that unknown land. Why, just think of it. All around our horizons are vast armies waiting for you to open the gates and let them in, forests to clothe the waste places of the farm, to pump gold for you from the mud, evergreen for steep hillsides, trees of rare symmetry and loveliness for your lawns, shrubs with blooms of red, pink, and snow, flowers in great masses clothed in fairer robes than ever were worn in palaces of kings.

I need not tell you of the beauty and of the grandeur beyond where the furrows in the fields of azure are blazing with stars in the limitless flower gardens of God. The brightest gems of earth are only the alphabet with which we read the splendors of the garments of the suns.

We are living in the margin of all that splendor and this borderland which touches it should have some forecasting of the glory to be revealed, so take what is yours—the wealth of the forest, the tree, the shrub, and the flower and fruit.

Man's stinginess and narrowness are insults to the Divine bounty. Man builds a mansion, or simply a comfortable dwelling and fills it with costly furniture, but when he goes into "God's great out-of-doors" a wave of poverty strikes and almost paralyses him. A ten-cent flower or a twenty-five cent tree is all he can afford. Think of putting a 3,00 dollar picture in a fifty-cent frame. The moment he moves into the house and occupies his furniture, both begin to depreciate and soon become second-hand goods, but let him fill that yard with the most delightful trees, shrubs and flowers which money can buy; let him plant in masses as God does and the moment they leave his hands, they begin to increase in value. We reiterate, "Beauty is wealth," so raise plenty of it and glorify the home.

Do some home missionary work for yourself in the evangel of beauty. You need it badly enough. Do something for your neighbors. You can not live down here long, at best, but leave a worthy trail behind you to let people know you passed this way.

A single farm, put to its best, would be a Mecca for pilgrims in search of the beautiful. A whole section of rich prairie would be like a section of paradise let down to earth. A whole township improved as it might be, would make earth so attractive that the best Chsistian would be willing to stay out of heaven awhile to enjoy it. Such surroundings would lengthen life and prolong a stay on earth Home would be a delightful memory to children in after years. If a man wanted a vacation, he could go over to the next section and lose himself in the delights of an earthy elysium. Such impsovements would lift a man out of the hog-and-hominy range into a higher life.

Cattle, horses, hog corn, and wheat are all right in themselves. They have given you competence so you can now fix up and you will find that there are other things fully as attractive and beautiful as the hog, and yet, what farmer gives that front yard as much attention as he does his pig-pen?

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THE RED OIL SPRAY.

Of the many enemies of the Peach grower, Aphis, must be counted as amongst the most serious. It is not so very long ago that Summer spraying and root treatment were considered the only method of combating this pest. Both were laborious, but the fruit grower continued to spray at intervals, and this with trees in full leaf was a considerable tax on time and profit. More recently, following American discoveries, the winter treatment of spraying with one of the mixable oils has gained much favor. Evidence has accumulated both in America and the Commonwealth, which points to one of these preparations of which Red Oil is probably the best, as a very certain cure, or we should say, preventive for, when applied at the right time, the appearance even of the Aphis, is stopped. Very extensive experiments were carried out last season in the Eastern States, with the result that the officials have very highly recommended the Red Oil Spray. It is important to remember, firstly, that the trees must be thoroughly done, and secondly, that the month of July or before there is any sign of bud swelling is the time when best results will be obtained, and no possible damage be done to the trees. Messrs. Chas. Atkins & Co., of 97 Currie Street, are the agents of an approved brand of Red Oil, and they will be pleased to forward the fullest information to any enquirer.

◆

We draw the attention of readers to Mr. C. F. Lill's advertisement in our columns. He has been in business in Norwood for 20 years in the furniture trade in conjunction with Land Agency; all customers can rely on fair, straight dealing. All old customers and new ones would do well to call at 257, Grenfell Street, and inspect his lot of properties.

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(Late T. J. Patterson).

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Send for range of patterns.

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257, GRENFELL STREET (Opp. New Market

Properties of all descriptions—City and Suburban—for investment. Acres near Morphettville, just suit gardeners for nursery work, especially adapted for it —real good honest bargains. Plans forwarded on application. A first class Separator small size, as good as new, for sale at half price. Note address—257, Grenfell Street.

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All kinds of fruit trees for sale, Citrus trees, Lemons and Oranges a speciality. Send for illustrated catalogue.

Telegraphic Address—Pike, Hectorville, Payneham. Telephone Central 2768.

The Orchard.

The Experimental Orchard at Blackwood.

It is four years ago since the Government purchased a block of land near Blackwood with an area of about 51¾ acres, at a cost of £800. The purchase money approximately averaged £16 per acre, and to-day the valuation has more than doubled. Over 30 acres have been laid out under orchard trees, and the success attending their cultivation has been responsible for the enhanced values. The property was bought on the recommendation of the Government fruit expert (Mr. G. Quinn), for use as an experimental orchard. That it will serve its purpose well is evident from the many experiments now in progress and the luxuriant growth of the trees. Despite the dry season, two and three-year-old apples have developed strong shoots up to 5 ft. in length. The property consists of low hill slopes, divided by a natural depression running from east to west. The soil for the most part is strong loam, over a friable red clay. In some places there were outcrops of stone, and these were removed to fill up holes in the lowest levels washed out by storm waters. In the south-eastern corner, where plums are planted, some tile drains were put in, and have proved effective. The water supply is drawn from two wells, being pumped in one case by means of a windmill, and in the other with a portable motor engine, which is also used as a spraying machine, being fitted up for that purpose. The water available is barely more than sufficient for nursery stocks, strawberry beds, &c. However, this is not a drawback, as irrigation was never contemplated.

— Consistent Tillage Ensures Luxuriance. —

The tilth maintained over the orchard is a regular blanket of loose soil, which effectually keeps evaporation of soil moisture down to a minimum. The effect has been to produce a grand growth on practically all trees, and at three years old many of these are models. The orchardist in charge is an old Roseworthy College student (Mr. C. G. Savage), and the invariable success that has attended the working or planting of hundreds of varieties of all stone and pip fruits is a tribute at once to the natural suitability of the conditions to a wide range of fruit, and to careful management. Under the direction of Mr. Quinn many interesting experiments have been planned, and these promise to be productive of instructive lessons. The value of cultivation is illustrated by the fact that practically none of the trees have suffered from the recent heat wave, while damage has been common enough in some commercial gardens. The only plots to suffer at all were the strawberries, and this was not unexpected. A thin mulch of cocky chaff has been used among these plants, as, unlike manure, it has the advantage of keeping the fruit clean.

— Some Manurial Experiments. —

Manurial tests have been planned in rows of trees each comprising three apples, three pears, and three peaches, with alternate unmanured rows for spraying experiments. Applications have been made as follows:—1, ¼ lb. sulphate or iron per tree; 2, 56 lb. stable manure; 3, 1 lb. super, ¼ lb. sulphate ammonia; 4, ¼ lb. each sulp. ammonia and sulphate of potash; 5, 2 lb. lime; 6, 1 lb. super, ¼ lb. each sulphate of potash and sulphate ammonia and 2 lb. lime (the lime is applied at least one month before the other fertilisers, so that chemical changes by contact are avoided; 7, 1 lb. super, ¼ lb. each sulp. of potash and sulphate ammonia; 8, 1 lb. super, ¼ lb. sulphate ammonia; 9, 1 lb. super, 2 lb. lime; and 10, 1 lb. super. There are also three rows unmanured for checking purposes. As the trees develop the quantities allowed per tree will be increased. At present all are equally luxuriant in growth, and it is probable that the effects of the annual applications of fertilising agents will not be seen till the trees have been cropping for some seasons. Some of the combinations may tend to produce soil acidity, so that the effects, as told by the annual yields, will afford instruction. In low-lying ground near the pumping plant, where irrigation can be resorted to in order to produce conditions suitable for the development of bitter pit, a number of apple trees have been planted for observation purposes. They have been worked on various stocks, and in some cases upon stocks worked upon stocks, so that data may be provided by comparisons of the resulting fruits.

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Gembrook Nurseries,

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The Best Time to Plant.

Deciduous Trees.—As soon as the first rains render the ground workable I strongly recommend intending planters to at once get the ground ready for their trees, and to make every effort to get them planted by the end of May or the beginning of June. There are several reasons for this. In the first place one is able to get the pick of the nurserymen's stocks. In the second place, the work will be off your hands; but the chief reason is the good of the tree itself. Trees may be planted at any time from May to August, but I like early planting, except, perhaps, in a few particularly wet and cold localities. The work may be done as soon as the season's growth has ceased, and the soil is moist with the first good rains. There is no need to wait until the leaves have fallen from the trees, although it is decidedly preferable that the foliage should have ripened off, and has assumed the brown or yellow autumn tint, showing that their work is done.

That this is not at all necessary, however, is shown by the fact that nurserymen take up large quantities of trees while they are yet quite green, and heel them in to ripen off more quickly. When they take them up in a few weeks it is found that they have made from one to three inches of new root growth. Therefore, it will be readily understood that if such trees are moved into their permanent position, instead of being heeled in, they make root growth, and become well established before the winter, and are ready to start right away into good growth in early spring, when the late-planted trees are making efforts to establish themselves.

I have tested this by experiment with irrigation, and have found a great difference in both cases, but, as might be expected, the advantage of autumn over spring planting is greater when artificial watering is not given. Not only is the risk of losing trees very much less, but the growth of the autumn-planted will often be fully 50 per cent. greater.

So strongly am I convinced on this point that were I planting a commercial orchard without irrigation, in any but the moister districts, I would rather wait a season than plant late. I do not know a good fruit district in Australia where autumn planting is not, in my opinion, preferable to spring.

I would sooner leave trees in the nursery for a season than plant them out late where the buds were swelling to burst into leaf. I know that if I pruned the young trees properly, and left them in the nursery, they would make good growth, and could be regulated into shape; but if I set them out in August the growth in an ordinary season would be weak, and with a considerable percentage of the trees all chance of inducing shapely growth, except by wasting one or two years, would be lost. If I left the trees in the nursery through the growing season I could use the orchard land for a field crop of some sort, which would pay working expenses. I would, of course, have it properly broken up in the spring, so that in the autumn I would only have to plough it and dig the holes when the first rains came. I would set the trees in May, while the soil was yet warm. The trees would at once establish themselves, and at the end of June, or in July I would prune them hard back entirely with a view to secure shapely growth of a few strong shoots, and next season the trees would do better than if they had been set out nine months earlier.

Evergreen Trees and Shrubs.—So far I have spoken of deciduous trees, but the argument applies still more strongly to evergreens. Oranges and lemons, and any trees or shrubs which can be watered, are best planted in most places as early in April as possible, so that they may get well hold of the ground while it is warm and genial. The beginning of a cool change should be selected for the work, and the plants should be well watered in.

There are exceptions to this, as there are to all general rules, but they are not as common as many would think. Take the case of a wet, cold soil. If in addition to the ordinary cold and wet, the locality be subject to severe frosts, it might not be advisable to plant until spring; but under such conditions spring planting must be delayed until very late, because such soils usually cannot be worked until late, and then the weather generally sets in dry for months. If, on the other hand, the land is ready, and the plants are set out with the first good rains, they can be planted easily, because the ground works nicely in autumn, and are, if suitable to the conditions, established before the soil becomes cold and wet, and will not suffer from it. In the case of more delicate trees, like oranges and lemons, which are only planted where they can be irrigated, there are seasons when spring appears to be preferable to autumn for the period of removal. I am, however, of opinion that where the conditions are such that the soil is too wet and cold in winter for autumn planting, the growth of the orange and lemon on a commercial scale had better not be attempted.

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Planting the Orange and Lemon.

Where to Plant.—Orange and lemon
rees for a commercial orchard should
nly be planted in soil and in a loca-
ity proved to be suitable. For ex-
erimental purposes a few trees may
e planted anywhere. In a home
arden, if suitable conditions do not
xist, they can be created. It is only
matter of money and care.

When to Plant.—A leading nursery-
nan once remarked to the writer:—
I will transplant an orange tree so
hat it will thrive on any day of the
ear you like to name, whether it be
he hottest or the coldest, the dryest
r the wettest, but for choice I pre-
er early autumn, and, failing that,
pring." We believe that in four years
ut of five autumn is the best time,
nd recommend April.

How to Prepare the Land.—To
lant lemons or oranges on a large
cale the ground should be well bro-
en up all over and worked well to a
ood depth, say, 18 in. at least; and
or a home garden the same applies.
f this be done, the orthodox hole—
ft. square and 3 ft. deep—is not
ecessary, and often is not desirable.
f the whole area is not deeply work-
d it is necessary to double dig the
lace for the tree for a space of at
east 4 ft. square, and unless it be
eally well rotted, manure is not
eeded. It must be remembered that
transplanted tree is an invalid, and
nust not be overfed. What is wanted
s for the young tree to be at first
et in finely pulverised, light, loamy
oil, and after it has begun to grow
o be fed with manure if required.
Away from the roots bonedust and a
ew wood ashes may be mixed with
he soil before planting, but not touch-
ng them. They will go to the ma-
ure as soon as they want it if it be
ear and available. The ground
hould be worked deeply, but the
ole for the tree need only be shal-
ow, but should be large enough to
ake all the roots extended.

How to Move the Tree.—It is not
lways possible to get the trees as
ne may desire. The young tree
hould be dug out with a fork in
amp weather, or else with a hose or
vatering-can ready, so that as the
oots are laid bare they may be
prinkled with water. The big roots
nay be cut as may be convenient, but
he small roots should all be left on
s long as possible, but kept wet.
undle them up in soft, wet grass,
and wrap in canvas. If they have to travel far the tops also should be wrapped up to keep off the air.

How to Plant the Tree.—Arrange the hole so that the tree will be a little higher than in the nursery, and so that the bottom of the trunk where the roots start will be about level with the ground surface when the tree and soil have settled. To ensure this the planter must calculate how much settlement will take place, and will find that his newly-planted tree is on a slight mound. Water the soil in the hole, place the tree in position, spread out all the lower roots, taking care that none get dry, fill in earth as required, keeping it wet as filled in, and spread out the roots in their relative positions. There is no need to tread down the soil, for to do so would make pug. Watering the tree settles the soil better than treading. Put 3 in. of loose soil or mulch on top. Then thin out the top, in proportion to the amount of root cut away, leaving a nicely balanced number of shoots. Put three or four stakes round the tree, and cover the whole with a piece of canvas. All this is not practicable for some hundreds of trees, but it is for the man who is planting six, and it will ensure better results. After planting in autumn the trees should be watered every three or four days for a time, then once a week. This regular, moderate watering with shading at first is the secret of getting young trees to start growing. When they are established remove the shade.

If trees come from the nursery with balls of soil, as in the ordinary course they must do, we would advise the planter to put them in position at the right depth in the hole, after having cut off damaged ends of roots; then break away the ball of soil, and water the tree in as described above. It will often be found that when the ball is broken up and the roots well watered that the nurseryman has taken trouble to preserve fibrous roots, and has folded them round the ball, and covered them with soil. To plant the tree without disturbing the ball would be a mistake.

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Adelaide.

AND THROUGHOUT AUSTRALASIA.

The Loquat.

This useful fruit should be more .enerally cultivated in this part of the vorld. as it has much to recommend t. In the first place, the trees, as a ule, are very prolific, and when grow- ıg under fairly favorable conditions eldom fail in bearing heavy crops. hese conditions are in localities that re not subject to heavy frosts, hough the trees will not be seriously ffected by light ones. Trees will hrive in any fairly good soil of moderate depth, but flourish best in a rich, andy loam. A good depth of well- roken soil and effective drainage are ssential, and these conditions should lways be secured. Autumn planting : the best, but, unless the summer rowth has hardened, it is better to ait till early spring. If planted in rchard fashion the trees should stand bout 24 feet apart, to allow ample pace for development. Being an vergreen, with handsome foliage that ontrasts well with other trees and hrubs, the loquat may also be planted for ornamental purposes in shrub- eries. The trees also make very ood breakwinds for orchards and ardens, when, as a matter of course, ey should be planted thickly, say om ten to twelve feet apart. Prunıg and thinning out the branches hould be carefully attended to during e early year of growth, so as to obin compact, well-formed trees. Af- rwards, but little is required in the ay of pruning. The fruit can be tilised in various ways, and, where enerally known, is popular. When aten ripe it is refreshing and grate- l to the palate.

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Gembrook Nurseries.

The Gembrook Nursery Catalogue is ually the first to reach us each year nd is always one of the most com lete. The growth of the Nurseries traced through the many volumns hich Mr. Nobelius has issued, is in- resting. They now cover over two ındred acres, and the stock of fruit ees, shade trees, and ornamentals, umbers over one million ready r removal. Naturally this great umber includes an immense variety all sections and we can recommand ny of our readers who intend plant- g this season to make a point of nding for a copy. They will find e catalogue well printed, ' well lustrated, and well got up. Minor oints perhaps, but indicative of the oroughness and attention to detail hich has always characterized Mr. obelius' work.

In addition to the very great num- r of varieties of apples worked on tandard Stocks, Mr. Nobelius catalogues a fine assortment of dwarf trees, worked on "Northern Spy" "Paradise" Stock, which are specially adapted for close planting in small gardens; there is also a special list of "English Cider Apples," including Medialle. D'Or, described as a new cider apple from France. To those who wish to combine utility with the picturesque the list of Crab apples will be attractive. Mr. Nobelius stocks apricots largely, and most of the better known sorts are procurable either on plum or peach stocks, as may be desired. Several new cherries find a place in the list, which incfudes all commercial sorts. Nectarines are well represented, while the list of peaches is very extensive. Half a dozen new sorts being named. Pears are fully stocked and we note that a new variety, "Roosevelt" is listed, the description reading very attractively. Plums of every type, the Japanese being especially numerous, will prove of interest to those who wish to add to their collection. In addition we find mention made of the new Japanese ornamental plum, "Vesuvius"; though the fruit is of no value the note that there is nothing in hardy deciduous trees to compare with Vesuvius for beauty should bespeak for it a trial, by lovers of the beautiful. The despised but oftentimes profitable quince, is represented by 20 varieties including De Vranja, a new introduction from Servia, which is recommended for its prolific qualities; the fruit is described as enormous, weighing nearly 3lbs. and of very delicate flavor. A new variety, "Giant of Lescovay," imported from France, attains even a larger size, the flesh, remaining white when cooked. Oranges and lemons, persimmons, medlers, mulberries, grape vines, and all bush fruits are adequately catalogued. The list of ornamental trees is an extensive one, and grown under the favourable conditions found at Emerald we have little doubt that buyers would have every reason to be extremely satisfied with their purchases. Lists of double flowering cherries and peaches together with an unusually extensive collection of lilacs, completes a catalogue which may be said to worthily represent one of the finest collections of plants in the Commonwealth. It will be sent free to any applicants.

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Publication Received.

One of the most practically useful books which has reached our table for a long time, is entitled, "Stock Owner's Guide." from the Pastoral Review Co., Melbourne. The book is one, which cannot fail to be helpful, to anyone having the management of stock. Much of the letterpress and many of the very numerous illustrations and diagrams, have already appeared in the pages of our contemporary but it is an admirable idea to thus bring such a wealth of information within the convenient limit of the volume before us. Primarily the contents have been written and this volume compiled, for the benefit of the big country man who reckons land by the mile, and stock by the thousand, but it will be found no less helpful to those who are working on a much smaller scale. To even summarize the chapters would take more space than we have at our disposal, but we can safely say there is no detail, of stock management, but what finds mention, and helpful suggestion in these pages. The volume will occupy a convenient corner on our shelves and we can very cordially bespeak for it, a similiar position on those of all our readers who are interested in the subject with which it so admirably deals.

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Bottling Grapes.

Edwin Molyneux, in his work, "Grape Growing for Amateurs" (Upcott Gill), says:—"Grapes can be preserved for five months after being cut from the vine by bottling them, and, indeed, I have seen bunches of Lady Downs kept quite fresh and fit for exhibition after being in bottle for eight months.

"Before bottling the grapes must be perfectly ripened, as the skin of the berries is then tougher and less likely to decay afterwards. The best varieties for keeping are Lady Downs, Alicante, Gros Colman, Alnwick Seedling, and Muscat of Alexandria."

It is not necessary to have a grape-room erected for the purpose of storing bottled grapes only, as they can be kept very well in any suitable room; thorough dryness, darkness, and an equable temperature of, say 40 deg. to 45 deg., being essential, though, perhaps, it is not absolutely necessary for the room to be thoroughly darkened, as the grapes will keep quite fresh in an ordinary room. If, however, a room is set apart for them it will be better if it is darkened and kept close at the temperature named. The great mischief to guard against is damp, although fire-heat is bad for the keeping of the fruit; and if the room is dry and can be kept at the right temperature without having recourse to artificial means, so much the better. Where a large number of bunches have to be dealt with it is necessary to have properly-constructed racks with bottles to correspond, these latter being short with wide necks; but in the case of the amateur with but a few bunches, perhaps any ordinary wine bottle will suffice, and this can easily be hung up to a nail in the rafters of the roof, or elsewhere. If a piece of wire be fastened round the neck of the bottle (which should be filled with clean water), the weight of the bunch will balance the bottle when hung up, and in this way the grapes will hang clear of the bottle.

Three to six inches of stem should be allowed to each shoot below the bunch, according to the distance of the bunch from the main rod. In cutting the stem upon which the bunch is borne, care should be taken not to interfere with the eye nearest the stem of the vine, as these are intended to be left in pruning to give the next season's crop of fruit. This is the only point to be considered in determining the length of stem to cut in preparing for bottling the grapes. Where a choice of length of the shoots can be had, and the bottles in which the grapes are to be placed are not of a uniform size—and they need not be—it is better to allow 1 ft. of stem in some instances, because it will be found that if the stem reaches to the bottom of the bottle the bunches will balance better when the bottles are suspended from the neck. That really is the main point to consider. A small quantity—say, one teaspoonful—of not too finely powdered charcoal in each bottle of water will assist in keeping the water sweet for the bunches that are intended to hang the longest; but for hanging say one month or so, this is not necessary.

When the bunches are cut, they should be carefully examined to see that there are no decayed berries in the centre; and if there are any they should be at once removed, or the berries nearest to them will decay also. Indeed, this point should not be lost sight of afterwards, and the bunches should be examined every week; for it is surprising how quickly one decaying berry will taint all those around it.

After the bunches have been cut about two days, more water must be added to that in the bottles as the stems will have absorbed a quantity and any of these which were short may be quite dry on account of the absorption; but if the bottles be once again filled up after a lapse of two or three days, no more will be required afterwards.

The stems above the bunches should be left intact, as the berries are not then so liable to shrivel. Sometimes it is necessary to remove the point of the shoot, or even to place the stem in the water above the bunch in consequence of the bunch being situated near to the stem or in an otherwise peculiar position. In that case, these bunches should be used first, as they are more likely to shrivel than those which have their shoots intact.

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Vegetable Notes for April.

Have a Succession of Plants.— The greatest mistake made with respect to home vegetable growing is to sow a plant too much at once. If we think for a moment, it is evident that a home cannot use a very large bed of turnips while they are in their best condition, and the same argument applies to all vegetables, except, perhaps, such as potatoes, onions, and marrows, which can be stored for months. I cannot too strongly urge upon amateurs the benefit to be derived from sowing successive lots of seed at such intervals that one bed will be coming on as the former sowing is about used. Another strong argument in favor of this plan is the fact that when there is a glut of anything it seems a natural thing to get tired of it. Now, we should never have enough of any vegetable to give this impression. A dozen or twenty cabbages or cauliflowers coming on at once is about all that an ordinary family can consume while they are young and at their prime; but the average amateur will put in 50. Of course, when fowls are kept it is well to plant extra, so that only the best can be used, and the others given to the chickens.

Sow seeds of artichoke, asparagus, broad beans, brocoli, Brussels sprouts (a much neglected vegetable), cabbage, carrot, cress, cauliflower, celery, endive, herbs, garlic, kohl rabi, leek, lettuce, mustard, onion, parsley, parsnip, peas, raddish, spinach, tree onion, white and red beet.

Plant potatoes, onions, cabbages, cauliflowers, artichokes, brocoli, herbs, Jerusalem artichokes, celery, sea kale; all in successive beds.

Mushroom beds may be made.

Asparagus.—Cut off tops and give a top dressing of manure and coarse salt.

Herbs.—Take up, divide, and transplant thyme, sage, marjoram, and other herbs.

Horseradish.—Plant at end of month.

Where carrots, parsnips, or turnips are sufficiently far advanced, they should be thinned out. Spinach leaves are allowed to grow to too great a size before being gathered by the majority of growers. Two sowings will give pickings throughout winter ard spring, if a start be made to pick off the leaves as soon as they begin to assume the rough stage, though they may not be large enough to cover the surface of a tablespoon. The old haulms of dwarf beans should be raked up in heaps and burnt.

In some earlier plantations of cabbages and cauliflowers the green cabbage worn (Plutella cruciferarum) has begun its ravages, and efforts should be made at once with tar water or tobacco water to destroy them. On a home garden, where there are only a few plants, the easiest way is to take a tin of tar or tobacco water and a small piece of sponge, and rub over each leaf, crushing the larger caterpillars, and letting the wash do for the rest. The extra trouble of this plan will be repaid.

Where tomato bushes are going to decay the haulms should be burnt, as well as the old rotting fruit, as some of the destructive fungoid diseases of this plant may increase, and leave large numbers of spores to re-infect the plants again next year, if grown on the same land—a practice which should be avoided as far as convenient with most vegetables.

Fertilizing Asparagus.

Methods of fertilizing garden asparagus have frequently been referred in these pages.

Recent experiments and observations at the Maryland Experiment Station, deal with soils and fertilizers for field culture of this crop, as follows :—

" Almost any well-drained soil with plenty of humus in it will grow asparagus, but a good rich sandy loam is best. In preparing the ground for planting it should be deeply plowed and have large quantities of rotted manure worked into it. The asparagus grower must use whatever commercial fertilizer he has most faith in, because experimenters and growers do not agree as to what is best. Perhaps 1,000 to 2,000 pounds of kainit per acre in mid-season is as good as anything, however, if a complete fertilizer is preferred the followong is good : 400 pounds kainit, and 200 pounds nitrate of soda in early spring.

The very best plants are strong 1-year olds. About the only advantage in using older plants is that there is not so long to wait until they bloom so as to distinguish the males from the females and select the males which are the strongest and best producers.

After being thoroughly worked up the ground should be laid off in furrows 6 to 8 inches deep and from 4 to 6 feet apart. The best time for planting is early in spring. The plants are set about 2 feet apart in the furrows and where they are placed the ground is often mounded slightly. The roots are spread out carefully and the earth is filled in 2 or 3 inches over the plants or " crowns " and as growth proceeds the ground is cultivated in until the furrows are finally filled. Thorough cultivation should be continued during the entire season and in late fall the tops should be cut off and removed from the field and be burned to destroy disease germs and insects.

The second year a good coating of stable manure, or 1,000 pounds of kainit per acre, or both, should be applied early in the spring and the entire surface should be plowed 4 inches deep. After thorough harrowing the shoots may be given time to grow a few inches, when cultivation should be begun and be repeated every 10 days or 2 weeks during the season In late fall the stalks are again cut off and removed for burning. No cutting for market should be done the second year.

The third and succeeding years a light covering of rotted manure, about 5 tons per acre, should be given during the winter or early spring every year if possible, or every second year certainly. In connection with this manure some commercial fertilizer thould be used, either a complete fertilizer as mentioned below or kainit 1,000 to 2,000 pounds per acre. If manure is not available then a complete fertilizer must be used in early spring, at least 400 pounds superphosphate, 400 pouods kanit, and 200 pounds nitrate of soda.

The ground should be plowed and harrowed again in early spring.

The kind of stalks desired for cutting, whether green or white, will determine how the ground will be handled at this time. If " green " stalks are wanted the ground may be left nearly level or at most only a slight ridge be made over the row.

If " white " stalks are desired, furrows from each side must be thrown over the row to form a round or flat topped ridge 8 or more inches high. There are special asparagus plows which do this ridging to perfection. The stalks must grow through the ridge and are blanched by doing so. The ground must be kept cultivated to keep down weeds.

As soon as the cultivating season is over in winter the entire ground is plowed about 4 inches deep and well harrowed. The shoots are then allowed to grow. Good cultivation must be given so that large amounts of plant food may be stored up in the roots and crowns to produce strong shoots the following year. After the tops die in the fall they should be removed and burned as before.

Fruit Reminders for April.

The summer has been a very dry and trying one for fruit trees on the plains and in the drier districts.

Orange and lemon trees may be moved at any time if water is available, and the sooner the work is done the better.

Almond, Peach, and Apricot trees may be pruned in April if it be desired to do so.

The budding of orange and lemon trees may still be carried on with ease and success.

As soon as the soil receives the first rains, or before that if it can be done, orchards and vineyards should be roughly ploughed to take in the autumn rains. It is a mistake to think that because a soil is dry it is "thirsty," and will absorb moisture rapidly. As a matter of fact, anyone who has tried to wet a heap of almost perfectly dry dust knows that it is one of the hardest things to do He also knows how large an amount of water a layer of dust will absorb. Plough up the orchard roughly across the slope, so that the rains will not beat down the surface into a waterproof cloak, and then run off to waste.

Land for deciduous trees should be in fallow, so that with the first rains the holes can be dug ready for planting the trees at the end of May, by which time the soil should be mellow, warm, and moist for the reception of the trees, which will then at once make a little root growth, and become established before the winter.

In planting orange and lemon trees care must be exercised not to set them too deeply; neither should they be planted on hills. The depth should be so judged that when the soil and tree have sunk, as newly-planted trees always do, the base of the trunk where where the upper roots start should be just above the surface.

◆

Orchard Planting.

The recent disastrous fires in the hills will, it is believed, necessitate the replanting of large areas of orchard land, and it is characteristic of the Australian fruitgrower that he should individually and collectively face such a calamity with calmness and courage. In some cases the growth of years has been entirely swept away whilst in many others very large replacements will have to be made. Possibly in some instances the disaster is not wholly without its advantages for much land that was growing unsuitable fruits and inferior varieties has been swept clean and growers have the opportunity, unwelcome as it may be, of replanting with the knowledge gained in the past to assist them. It is, perhaps, opportune to remind intending planters that well grown, clean and true to name stock is essential and must be the basis of all profitable orchard work, and it is particularly fortunate that Australian nurserymen pride themselves, and do so with justice, on the high standard maintained in their nursery grounds. Mr. Pike, of the Clairville Nursery, Hectorville, is one of those whose names may with confidence be mentioned in this connection. Though not of very long standing in the local trade Mr. Pike, when he purchased his present property, also bought a ready-made reputation, and it is doing him only the barest justice to say that nothing has been left undone to maintain his nursery stock in the highest possible condition. The extent and quality of the orange and lemon plantings at Clairville is of course well known for citrus is made a speciality there, and of this buyers will be wise to take advantage.

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The Arab Horse.

It is said that the ancient breed of so-called Arabian horses, to which most of the improved modern racers owe many of their best qualities, is in imminent danger of becoming extinct, says the Montreal "Herald and Star." For hundreds of years the horse-breeders of all nations have been drawing on Arabia for stallions and mares to improve the common stock, and this constant drain on a country having comparatively few horses in proportion to its population has, it is said, lowered the standard, besides depleting the numbers. Almost without exception the fine animals taken from the East to other parts of the world were used solely for the purpose of engrafting their superior qualities on the native breeds, and nowhere, it is believed, outside of the land of its nativity, has the Arab type been perpetuated to any extent worth considering. In England the influence of the Arab has resulted in the modern British thoroughbred, whose superiority as a racehorse is now acknowledged throughout the world. Though recent researches have exploded the famous dictum of Admiral Rous that the "British racehorse is a pure Eastern exotic, whose pedigree can be traced 2,000 years, the true son of 'Arabia Deserta,' without a drop of English blood in his veins," it cannot be denied that the Oriental horses imported into England for racing purposes, at least as early as the time of Henry VIII. (1509), and probably during the Crusades, were the dominating element in the formation of the thoroughbred type, which, in turn, has been an important factor in building up the breed of American trotting horses. In Russia, Arab blood was introduced in the Imperial stud as early as the time of Peter the Great (1682), and from its use have come the present-day breed of Orloff trotters, which excel the Americans in purity of action, and in uniformity of type, if not in speed, and the Russian breed of carriage horses. In France, Germany, and other countries of Continental Europe, Eastern blood has been engrafted in the horse stock to an extent as great as in England and Russia; while Spain, Hungary, and Austria, which were overrun in the middle ages by the followers of Mohammed, acquired thousands of horses of Oriental ancestry by these invasions. The grey Arabs have left their mark on the horses of France, where the trappy, active, rapid-walking Percheron draughters inherit the color as well as other characteristics of their remote Arabian ancestors.

The type of horse that is commonly called Arabian has been found in different ages in various countries bordering on the Mediterranean Sea, notably in Turkey, Asia Minor, Arabia, Egypt, the Barbary States, and Spain. From time immemorial until a very recent period horse historians were agreed that Arabia was the original habitat of this superior breed, which has refined the horse stock of the world.

The long-accepted belief was based chiefly if not wholly on the traditions and legends of the Arabs themselves, who assumed to trace the pedigrees of their fine horses straight back without taint of foreign blood to five famous mares owned by Sheik Salaman, who was fourth in descent from Ishmael, son of Abraham, and who lived about 3,500 years ago.

These five famous mares were supposed to belong to Mohammed until a few years ago, when Major Roger D. Upton, an English traveller in Arabia, taught the world their true history. It is an old story that, in order to select mares worthy of becoming the dams of the best horses the Prophet shut up a herd in plain sight of water, and kept them there until they were almost famished from thirst. Then they were all released at once, and when rushing headlong to the water the war trumpet was sounded as a test of obedience and discipline. Only five of the herd obeyed the signal, and turned, in spite of their suffering, to line up in battle array. These alone were chosen to perpetuate the breed, and they became known as "the Prophet's mares."

On such stories rest all that can be learned from the Bedouins themselves concerning the origin and history of the Arab horse. Scientists and scholars, who have written about the horse of antiquity, reject all these legends without according to them the dignity of mention.

That Arabia is the original habitat of the so-called Arabian horse has been shown to be wholly improbable. That Arabia had no horses at all until the beginning of the Christian era is now maintained by the weight of authority, ancient and modern.

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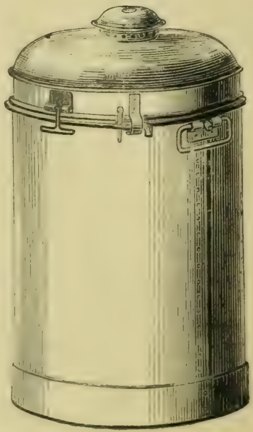

Railing Horses.

There are various details in regard to their equipment, etc., that should be seen to when horses are sent on a railway journey. It is most important, for one thing, that they should be clothed sufficiently warmly, more especially in the autumn and winter seasons, when a couple of warm, thick rugs are none too much for a horse which is being sent by rail. In cold weather three rugs are sometimes put on. In many cases it may be advisable also to provide a hood. The rug or rugs require to be put on with care, and the roller must be drawn up some what more tightly than is usually done in the stable, so as to avoid the risk of the rugs slipping off the horse's back in the horse-box. It is no uncommon thing to find the rug or rugs dangling from underneath the horse torn to pieces, having been trodden upon by the hind-feet, when the horse arrives at its destination, and is taken out of the horse-box. When this occurs there is risk of the horse catching cold, to say nothing of the rugs being torn and spoilt. Well-bred horses, which are of nervous temperament, often sweat profusely on a railway journey from sheer nervousness and excitement when they are not accustomed to travelling by rail. Such are frequently found to be wet with perspiration when their horse-box is opened at the journey's end, and unless they are sufficiently warmly rugged, they may very easily catch cold.

The most suitable kind of bridle to put on a horse that is being sent on a railway journey is a snaffle- or watering-bridle, with a snaffle-bit without any cheeks. Both snaffle-bits with cheeks and curb-bits are objectionable to use for the purpose, because the projecting cheeks on these bits are liable to get caught or to hook into something when the horse is in the horse-box. This kind of accident not infrequently happens, and it results either in the horse injuring its mouth or in the bit being bent. Hence the reason why a snaffle-bit with rings only, and without cheeks, is best, and why snaffles with cheeks and curb-bits should be avoided when a horse is sent by rail. The reins on the bridle must be knotted at the horse's withers, and must then be secured to the roller by means of a piece of string, so as to obviate all risk of the reins hanging down too low on one side, and the horse catching one of its forelegs in them.

It need hardly be said that a horse should never be tied up by the bridle in a horse-box. A leather headstall is provided in horse-boxes for the purpose of tying up the horse, this headstall being put on over the bridle which the animal is wearing. Although there is a headstall in horse-boxes, it is, as a rule, advisable to put a headstall—with a hemp halter-rein attached to it—on a horse underneath the bridle when sending it on a railway journey. The headstall and rope come in handy often enough for tying up the horse when occasion may require it. In the case of horses which are quite quiet and easy to manage there is no reason why the bridle should not be taken off as soon as the horse is safely boxed, provided, of course, that there is a headstall or a halter underneath the bridle by which to hold it. It will certainly add to the comfort of the horse on a long journey. But where horses are intractable it would be the reverse of wise to attempt to remove the bridle for the journey, as it might be difficult to put it on again quickly when the horse is unboxed at its destination, and, meanwhile, it might not be sufficiently under control without a bit in its mouth. There would be the danger of its breaking away during the process of unboxing it before the bridle could be put on.

Very commonly, when horses are sent by rail they are provided with knee-caps. This should always be done. They serve to protect the knees effectually against injuries and blows, a horse being very liable to knock or to cut the knee-joints when travelling by rail. Frequently the knee-caps are wrongly put on. The proper way is to buckle the upper strap of the knee-cap just sufficiently tightly to keep it in place, while the lower strap should be kept very loose. There must be room for three fingers to be placed between it and the horse's leg when it has been buckled. Put on in this fashion, the knee-caps retain their place perfectly, while they do not cause any discomfort to the horse. Oftentimes both the upper and the lower straps of the knee-cap are buckled up much too tightly, with the result that the circulation of blood is impeded, and that the horse suffers discomfort and inconvenience, while the tightly-drawn straps may also chafe the skin if the knee-caps are left on for long. If the lower strap of the knee-cap is buckled up at all tightly the free movement of the knee-joint is interfered with, and the horse is hurt by the strap cutting into the skin at the back of he leg each time the latter is bent. Frequently knee-caps are used which are too small for the horse; they should be of large size in order to be comfortable.

When a horse is sent by rail the animal's legs may be further protected against possible injury by being bandaged. This is very usually done in the case of valuable horses, and the use of the bandages is an excellent plan, as they afford complete protection against external injuries. Horses do get knocked about a bit when travelling in a horse-box, owing to the jolting and lurching of the latter, and there is always some risk of the legs being cut or getting a blow. The risk of the legs being injured is much increased when the horse is nervous and excited, and does not stand quietly in the horse-box, but is unsteady and unruly, as so many well-bred horses are when they are shut up in a horse-box. The bandages need to be put on carefully, otherwise they are very apt to come undone during the journey. They should be wound round the leg right

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down to the coronet, so as to cover the fetlock and the pastern, as well as the canon. The forelegs are more liable to be accidentally injured than the hind ones, and have greater need of protection. For this reason horses are very often bandaged on the forelegs only, and not behind as well. In most cases it is sufficient, yet where really valuable horses are concerned, it is advisable to bandage all four legs. In some cases, when a horse is being sent on a railway journey the animal is equipped with a pair of hock-boots for the purpose of protecting the hocks, but these articles are not often used. There is, as a general rule, no necessity for them, and it is only in the case of show horses and other very valuable animals that they can be advantageously used. In some few cases a leather tail-guard forms part of a horse's travelling equipment, the object of this being to prevent the hair on the dock of the tail from being rubbed. A tail-guard is, however, wholly superfluous under ordinary conditions.

To entrain horses is oftentimes a difficult job, many objecting strongly at first to go into the horse-box. Usually when difficulties of this kind are experienced the horse can be persuaded to enter by cajoling it, if sufficient patience is exercised. In the case of well-bred and high-spirited horses great care should be taken not to rouse the animal's temper, and to avoid rendering them obstinate by rough treatment and punishment, for once their temper has been upset and their obstinacy has been excited, there is no doing anything with them at all. If the animal is nervous and afraid to approach the horsebox it should be allowed to familiarise itself therewith by looking at it for a while, and then —having gradually been coaxed nearer—by smelling at it. One must take one's time about the job, and it is no good being in any hurry over it, the chief thing being to exercise plenty of patience. In some cases it proves a good plan to cover up the eyes of the horse by putting a cloth over its head, so that it cannot see, when it may allow itself to be led into the horse-box without trouble; but in many cases this expedient will not answer at all, and covering may make matters worse by upsetting the animal. It all depends upon the nature of the horse; and horses require to be managed according to their disposition. In the case of under-bred horses of a phlegmatic temperament a little forceful persuasion may not be out of place, and may prove very effective in inducing them to enter the horse-box. They usually give in to forceful measures with equanimity, whereas high-spirited horses resist all the more, and become more intractable when force is employed. Sometimes, when difficulties are experienced in entraining a horse, it proves a useful expedient to back the animal into the horse-box, and this plan may be tried when necessary.

But very frequently—in fact, in the majority of cases—it is found that a horse which refuses to enter the horse-box readily when led will not allow itself to be backed into it. The loud sound which is occasioned when the horse steps on to the wooden planks of the horse-box very often frightens the animal, and causes it to break away again from the box every time it has begun to enter it. In the case of horses that are very nervous and give a great deal of trouble while being entrained it is a good plan to cover the let-down side (forming the gangway) and the floor of the horse-box with some straw, so as to prevent the wooden boards from resounding when the horse steps on them. We have occasionally found this to be a most useful and successful plan. When it is anticipated that a horse will be troublesome to entrain, the best thing is to tire the animal beforehand by giving it a couple of hours' exercise or work. That will render the horse far more amenable and tractable than when it is perfectly fresh. Care should, of course, be taken when the horse is thus exercised that it has cooled down completely before being taken to the railway station to be entrained. It would not do to put it in the horse-box when in at all a heated state, as under such circumstances there is much risk of its catching cold.—"Farm and Home."

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On Choosing a Boar.

Some stock enthusiasts hold to the opinion that, however great the improvement made of late years among farmers' cattle and sheep, the degree of improvement is but slight as compared with that displayed among their pigs. One does not want to cast unnecessary reflection upon the deficiencies of the local pig, say, fifteen or twenty years ago, but one can fairly say that the genus pig, as represented at our weekly market sales in the Corporation yards, or at our constantly occurring sales throughout the country districts, is altogether an article of better type than was then the case. The Berkshire and the White Yorkshire are still the more impressionable types to be met with, though a cross between the Berkshire and the Tamworth is now becoming more conspicuous in the sale pens. The Essex and the China still have their admirers, but the long-snouted French pig has distinctly lost ground, his place having been taken by another long-nosed type, the Tamworth, whilst the old-fashioned homely grey Irish is very seldom to be met with. Long snouts are usually associated with leanness, just as the peculiar build of the China pig spells fat, if not blubber. By a process of feeding it is possible to build up streaks alternating with fat, and generally to increase the selling quality of the animal by a judicious diet of hard stuff or grain, during the few closing weeks antecedent to reaching the slaughter-house. However, though most of us will admit that the pig, as a type, has improved greatly during recent years, none will controvert the statement that there is still big scope for further improvement. It is something to be able to retain such a degree of improvement as has already been established, and the great inducements in that direction are the ability to steer clear of swine fever, with all its disastrous consequences, and a satisfactory price for the best descriptions of pork.

In the business of breeding pigs, no matter how good the sows may be, the stock will soon deteriorate, if inferior boars are used. Every farmer who keeps even two or three sows should also keep his own boar. The habit of driving or carrying off the sow to any neighbour who happens to own a boar, of no matter what breed, is sure to result in debilitated progeny if persisted in, and is not infrequently the cause of transmitting disease to the herd. It is a well-known principle of all stock-breeding, and is more than all else applicable to pigs, that the male parent mostly determines the internal structure of the offspring. This being the case, any breeder or farmer will see the importance of buying a fine thoroughbred animal with a vigorous constitution. A well-known writer, Mr. Coburn, in his book on "Swine Husbandry," gives the following as prominent characteristics of a fine boar:—

"The boar should have a fine extended form, which is the result of a superior organism; a short, broad face, with a round, heavy under-jaw, and thick, short neck, indicating strong vitality and assimilating powers, two functions requisite in every first-class meat-producing animal; width between the fore-legs, and large girth immediately behind them, denote room for large and active lungs, the very foundation of any animal. Ribs that are long and well sprung outward from the back show capacity of stomach. The broad loin and well-developed ham are signs of active kidneys. A clean, fine, and elastic skin, covered with soft, lively hair, free from bristles, denotes a healthy liver and freedom from internal fever. A fine muzzle and limbs, clean, small joints, and standing square upon the feet, denote solidarity, strength, and firmness of the animal's framework; while the dished or concave face, and slightly drooping ear are unerring signs of an easy keeper and a quiet, contented disposition.

Having such a boar, the next important step is to keep him. The commonest mistake is to confine him in a close, small pen, with insufficient yard-room. Every animal, especially those which are to serve as sires, needs plenty of fresh air and exercise, and only a moderate amount of food. The boar's pen should be at least 12 ft. x 12 ft., with plenty of sunlight—ever easily procurable in this country—and a yard of not less than 100 ft. x 12 ft., and should be well away from the other pig pens. Fretting of any sort is detrimental to condition, hence the wisdom of keeping the boar out of sight, sound, and smell of the other pigs. Never lose sight of the fact that your boar is to be the sire of your future pigs, and should have the best of care, attention, and food.

In the last-named respect a strong, vigorous boar, from one to four years old, may be fed chiefly on swill, stirred with barley, pea, and oatmeal. But by swill is meant good, wholesome refuse, no entrails, chicken bones, or decayed food. In summer green food, especially chopped lucerne, should be fed freely.

The number of sows which a boar is capable of serving or should be

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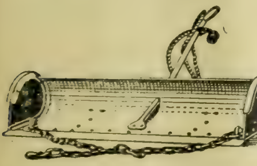
allowed to serve, will depend on the age of the boar, and also on the constitutional vigor. An English authority puts the limit at fifty sows a year. The pen should be kept clean, and the yard occasionally raked. Clean water should be on hand both summer and winter. Whereas in the Old Country the custom is to indulge the boar with a little grooming, it is possible to supplement this attention in the summer with a dip into some bath of weak antiseptic solution. The skin is thus kept in a healthy condition. As with all classes of stock, kind treatment results in a quiet-dispositioned animal, and one that will be easy to handle in the breeding season.

— Itch. —

Pigs, as we all know, dearly love to be scratched. Frequently, however, pigs can be seen indulging in a degree of scratching and rubbing which points to more than slight irritation of the skin or a proceeding undertaken as an amusement. Occasionally the trouble is lice, and sometimes mange, or "itch" (technically scabies), but happily porcine scabies is very rare in this country. Lice should be visible to the ordinary human eye if the pig has been carefully examined, because the pig louse is a big one, the largest of the tribe, and it is scarcely possible to overlook its presence. The determination of the existence of itch is not so easy, for it requires experience and skill in the use of the microscope to distinguish between itch and eczema. Washing with good strong carbolic soap, and daily application of sulphur and carbolised oil will settle both complaints without risk, and can be used with satisfactory results on cows and horses. The usual chemical treatment for eczema is powerless to cure mange, and that suitable for mange is likely to aggravate eczema; but the above is safely destructive to either.



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Steer and Heifer Beef.

With the object of finding out something about the relative value of bullocks and heifers for feeding purposes, experiments were carried out by the United States Department of Agriculture. The experiments have been carried on for some years, and the results should prove interesting. In the first trial five animals were used in each lot, one lot being steers, another spayed heifers, and a third open heifers. They were Shorthorns of like breeding, and treated alike previous to tests. In this case several of the heifers calved and interfered with the trial, and too much importance must not be attached to the results. The steers made the larger gain, and sold at ½d. per lb. more than the heifers. The steers made an average gain in eleven months of 806 lb., and one heifer, clear of calf, made 775 lb. When slaughtered the carcases were examined by an expert, and the heifers were found to give a larger percentage of prime cuts than the steers, so that on the basis of meat and by-products obtained the heifers were worth fully ¼d. per lb. more than was paid for them. Crediting each lot with the actual value of the different cuts and the by-products, and not including the expense of killing and handling, it was calculated that the butcher made about three times as much out of the heifers as out of the bullocks.

The second trials were made with fifteen pure-bred Herefords. The animals were proportioned as before. In this case the gain by the open heifers was 1.86 lb. per day, being greater than either of the other lots, and that, too, with less food and at less cost. There was very litle difference between the other two lots, either as regards gain per day or cost of the gain, though the heifers had the advantage. Carefully-conducted slaughter and block tests failed to show any difference in the quality of the meat, although the percentage of high-priced cuts, ribs, and loins was greater in both lots of heifers than in the case of the steers. It has been claimed that in heifer carcases there is a greater percentage of fat, thereby rendering them of less value to the consumer. The report concludes: "It was observed in this and other investigations that under similar conditions heifers are inclined to take on flesh a little more readily than bullocks. Larger gains by the heifers may not be shown, but there is a tendency to finish at a little earlier stage in the process of fattening. The difference between bullocks and heifers in this respect, when fed under the same conditions, has also been noted by practical stockmen feeding on an extensive scale."

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A Useful Paint.

A serviceable paint for farm buildings can be made by thickening sour milk or butter-milk with Portland cement and metallic venetian red or bright-red paint powder to the ordinary consistency. I painted the outside of my barn (rough timber) with this mixture (says a correspondent of the "Prairie Farmer") and also painted a few boards with ordinary oil paint as a check, and six years after the milk paint had preserved the wood better than the oil paint. It has kept its color and shows no sign of age. This paint will not rub nor wash off like whitewash. The grease in the milk seems to have the fixing quality, as I tried using water with the cement and paint, and found it rubbed off rapidly. For this reason it is judged that sour milk is better than butter-milk, as it contains more grease. This sort of paint costs but little, and can be mixed up instantly. It is very valuable for doing little odd painting jobs around the farm which might not otherwise get done. It is necesary to keep agitating the paint, as the cement settles quickly.

Even after ringbone or spavin has developed, either may often be cured by proper treatment of the feet, and by applying a fly-blister. The fly-blister is prepared by thoroughly mixing one ounce of pulverised cantharides, one ounce of biniodide of mercury, and eight ounces of lard. The hair is clipped over the part and the blister applied with considerable rubbing. The horses' head should be tied so as to prevent his biting the part blistered. A second application of the blister is to be used about a month after the first.

Raising Good Beef.

From "Homestead."

There are a great number of calves, the offspring of the general-purpose grade Shorthorns which are commonly found on farms, that are raised on skim milk, and are used for the production of beef. It is easy, by good feeding, to produce excellent animals in this way; but, as every one who has bought steers for feeding can testify, great numbers of these cattle are utterly spoiled by bad methods of feeding during the time they are calves, and are so stunted that no amount of good feeding at a later period can make really good cattle of them. It is of the utmost importance that the calf which is intended for beef should have a good start, and should form, while yet a calf, those habits of growth, thriftiness, and constitution which are the necessary characteristics of a good beef animal. To accomplish this end, good and careful feeding is necessary. In the milk food of the calf raised for beef a little generosity will prove the best economy. Those who take the calf at once from its mother and put it on skim milk at the end of a week or ten days, may save a little cream, but they run the risk of injuring the delicate digestive organs of the young animal so as to permanently retard its growth. It is a much safer practice to allow the young calf to remain with its mother for a day or two, so that she may nurse it and give it a good start; then to remove it, and give it warm, new milk, in moderate feeds, twice a day, for four or five weeks. It is a great mistake to feed even new milk from a pail in excessive quantities. Four or five quarts twice daily will be ample feed, and to feed more is to run the risk of upsetting the youngster's digestive organs, even while all new milk is being used.

At the end of four or five weeks the calf is stronger, and a gradual change may be made from new to skim-milk, taking ten days to two weeks to make the change, and being careful to have the skim-milk as nearly as possible at the temperature of new milk. At the same time some equivalent for the cream taken from the milk should be added. Starch, of course, fills much the same place as a food that fat does. It is not well, however, to use starchy foods as an equivalent for the butter-fat of the milk. The digestion of the starch is affected through the action of the saliva of the mouth, and where starchy foods are fed in milk they almost entirely escape this action, pass on to the stomach undigested, and cause trouble; hence, the fashion of feeding the meal of the ordinary grains in the milk, either raw or cooked, is not good, and is liable to lead to digestive troubles and perhaps to scouring. The best substitute for the cream taken from the milk is, by all odds flaxseed, either whole or ground, boiled into a thick gruel. Flaxseed contains a very large proportion of fat and protein, and a very small amount of starch, hence it may be fed safely in milk, as the action of the saliva is not so much needed in its digestion. Fed in small quantities at first, and afterwards increased until two cupfuls of the gruel are fed in the milk, it not only forms a good cream equivalent, but has an important action in preventing constipation and promoting that general appearance of thrift and well-being which is characteristic of the welldoer among beef cattle. The flaxseed should be continued until the calf is eating grain very freely. It is well to continue to feed milk as long as we can; at least till the calf is six or seven months old.

As soon as possible, while the calf is yet on new milk, it should be taught to eat. For this purpose a little good clover hay is very valuable. Whole oats are very soon relished, and the calf may safely be allowed all he will eat. It is very important, however, to see that no food is left in the manger. We should be very careful to feed no more than will be eaten up at one time, and if any is left it should be cleaned out of the manger before another feed is given. In the winter a little pulped roots, or even silage, may be given with advantage. In the summer we believe it is well to give the calves the run of a small paddock of grass, provided with a shelter from the sun during the day. Calves so treated do not present the sleek, smooth appearance of those which are kept constantly in the stable, but they develop a better constitution, and do better afterwards when turned out on the grass as yearlings to shift for themselves.

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The Sandbrick.

The sandbrick is as efficient as iron, wood, or stone, having greater stability; is cooler and more easily repaired than wood or iron; and is as cool and as easily repaired as stone. The material required is abundant throughout the North—i.e., good lime, clean, coarse sand, and water. Other materials (clean shell and small stone) can also be utilized. Lime can be burnt by the farmer on his own land, firewood and limestone being nearly always on the spot. Sand is not always obtainable on the spot; but in most of the creeks good sand and grit, etc., can be obtained. The material obtained, the next item is to turn it into blocks, 18 in. by 9 in. by 6 in. being a handy size, and equals 9 bushels of lime (three bags) to the 100 blocks, or 1 bushel to 11 blocks. The amount of lime varies with the quality of the sand used. The sand should

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be free from dirt, and of as even a grade as is possible. The proportions are three of sand to one of lime, well slaked. The material is then worked into thick mortar until the lime and sand are thoroughly united. It will take two or three turnings over to do this, and the more thoroughly this is done the better. The material being thoroughly prepared, is thrown with a little force into the wood moulds (simply a square box without a top or bottom) to completely fill it, and the surplus smoothed off with the shovel. In summer-time tde block will solidify quick enough to allow of one man using two moulds a day. In winter-time four or five moulds would be necessary. In summer-time blocks dry rapidly on the outside, leaving the inside wet. The result will be that the brick will either split or crack. To obviate this it is necessary to keep the blocks damp on outside for a day or two, to ensure even-drying. In winter-time the blocks dry more evenly. The more evenly the drying is conducted the stronger the block. The blocks should be carefully built on either concrete or stone foundation—concrete for preference—made of gravel or small stones or shells, in the proportion of one of lime to six of other material, the concrete to be at least 9 in. or 12 in. wider than the wall. In building into the wall the blocks should be laid in mortar of the same consistency as the block is made of, and the wall reinforced with two or three layers of fencing wire or hoop iron, especially under and over any of the door or window openings. Brick quoins and fencing wire should be used in cottage construction; but in farm buildings they are not required, and are not absolutely necessary in other construction. To carry the wall plates for roof or floor it is usual to build in 18in. tee bolts in the wall to which the plates are fixed. The wall, when completed, can be lined as the owner prefers, and made to look most attractive. The ideal block is made when the materials are carefully graded and intermixed, closely moulded, and slowly and evenly dried. The sandbrick will grow harder with time. Rain adds to its life, heat does not affect it, and very little attention will keep it in good repair. Sand blocks can be made by any man with a will to take the trouble to do it. Of course, tradesmen used to the work can turn out good work; but if care is taken success can be obtained by the average man every time."—From "Agricultural Bureau Reports."

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Paspalum Seed.

Paspalum seed, even that which is reported to be hand-shaken, is so often disappointing in its results that special interest attaches to any practical suggestion calculated to give a better chance of germination. In this connection a New Zealand farmer gives it as his opinion that the best method is to cut the seed-heads about 18 inches long with a reaping-hook, and place them in small bundles on the grass. Great care should be taken to handle it gently, as the ripe seed easily falls. Each day's cutting is taken at once to the barn, where it is placed in rows crossing each other, so as to allow free ventilation. In three days the bundles are shaken on a sheet or floor, the ripe seed coming out freely, and the unripe seed and husks, which remain on the stalk, are carted away and spread on the paddocks. The good seed is then placed on sheets spread out to dry, and sieved, after which it is placed in the seed bins. "I have sown the seed in October and November, and cut the ripe seed in the following March and April for first crop, and a month later cut it again, thus showing that it does not take five months for the seed-heads to ripen. As to leaving the seed in stooks, that is wrong. In the first place, it is almost impossible to stook paspalum grass. To show how easily the seed falls when ripe, a heavy wind or rain will send a great deal to the ground, which I know from experience, having lost much seed this season from this cause. Seed grown by men of experience can be brought up to 90 per cent. germinating-power. The grass can also be cut with machine for seed. Canvas covers are used along the row of cut grass, which is taken up and shaken on the sheet, and then thrown away for hay. You will in this way get only the very best seed, the unripe going with the hay. The machine will lay the grass down more gently than if cut by hand, and although you will get less seed it will be of the best quality."—"Sydney Daily Telegraph."

To make a good cow from a good calf two things must be guarded against—a lack of food to make a proper growth and the use of such food as will fatten instead of building up the frame and muscular system. The skim-milk-fed calf will usually make a better dairy cow than one that is allowed to suckle the old cow if sufficient pains be taken to give the skim-milk at the right time and of a proper temperature.

It is impossible to produce high-grade butter from low-grade milk, although some people think that can be done. There is no school of dairying that has been able to send out men that could take low-grade milk, and make either good butter or cheese from it. The same is true on the farm. When the pastures are full of weeds in midsummer, and the cows, by reason of the shortness of the grass, are driven to eating the weeds, the milk from such feed has a weedy taste and the milk products suffer.

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Superphosphate for Grass Land.

Attention is being directed continually by our agricultural experts to the great advantages of applying phosphate of lime on poor grass lands. The average yield of grass in this country could be very largely increased if farmers were to treat their grass lands with the same care that they do the crops grown on arable soil. We have before us just now a brochure on the utility of superphosphate as a spring top-dressing for grass lands, to which Professor Wrightson, of Downton College, has written some interesting introductory remarks. He points out that owing to the unceasing drain of phosphates from all descriptions of cultivated soils, year after year, and century after century, it is no matter for surprise that our fields and pastures should have become denuded of this constituent. We are liable to think that arable fields are more subject to loss from cropping than pasture grounds, and this erroneous idea has controlled practice even down to the present time. It should, however, be remembered that pastures are perpetually being robbed by grazing animals. In their case it has been constant depletion, for while manures of various kinds are freely applied to arable land, pastures are too often neglected, and supposed to preserve their fertility through the simple act of grazing. This view is evidently incorrect, and especially so when milk-selling is practised. We are accustomed to think that two, or more than two, white straw crops in succession exhaust a field, and to forget that a cow yielding 600 gallons of milk, say, from April 1 to November 1, removes 12 lb. of phosphoric acid from an acre of land, besides what she stores up in the body of her unborn calf. Such a cow removes at least 15 lb. of phosphoric acid from the land on which she grazes every year, whereas two corn crops only remove 42 lb. in four years. It is, therefore, certain that in four years a good cow will remove 50 per cent. more phosphoric acid from an acre of land, supposing she grazes an acre. Even if she requires 1½ acres of good pasture to support her, she will remove as much phosphoric acid per acre as is removed by corn-growing on the four-course system. What would be thought of a farmer who never manured his land? And yet it is quite as absurd to deplete grass land by selling milk, if the phosphoric acid is not restored by applications of superphosphate.

The consequences of this short-sighted policy are easily seen in the presence of sour, coarse grasses, which not even hunger will induce stock to eat; in the absence of clovers, and in the prevalence of buttercups, cowslips, daisies, yellow-rattle, red bartsia, moons, and sorrel, instead of rich and palatable grasses. My own first experience of the effects of superphosphate on coarse grass was gained by leaving one ridge unmanured in a field that was top-dressed with superphosphate. This ridge was conspicuous during the whole of the next season from its being absolutely neglected by cattle. The stock grazed all the remainder of the field closely, but this ridge was left rank with coarse herbage, which nothing would touch.

It is not only in quantity of grass that the effect is seen, but in quality, and it is extraordinary to notice how coarse species of grass, moss, and weedy herbage disappear under the influence of dressings of superphosphate. It is only necessary to try the effect in order to be convinced as to the enormous advantage of a backbone of phosphates on any pasture.—"Mark Lane Express."

It is said that all kinds of cattle are observed to be fonder of salt the farther they are distant from the sea. Thus, in America, the horses which are bred up near the sea show no extraordinary liking to salt while they remain near that element, but after being carried to a distance from it they become fonder of salt than of corn. The case is the same in Switzerland, and doubtless in other mountainous countries. Is it that there arises from the sea an exhalation so impregnated with saline particles as to render the use of salt there less necessary for cattle?

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When is a Cow at Her Best.

When is a cow at her best? According to a bulletin issued by the Wisconsin Dairy Station, a cow is at her best during her fifth and sixth years, up to which time the production of milk and butter-fat by cows in normal condition increases each year. The length of time the cow will maintain her maximum production depends on her constitutional strength and the care with which she is fed and managed. A good dairy cow should not show any marked falling-off until after ten years of age. Many excellent produced by heifers is somewhat bet- than this. The quality of the milk records have been made by cows older ter than that of the older cows, for a decrease had been noted of one to two-tenths of one per cent in the average fat content for each year until the cows have reached the full age. This is caused by the increase in weight of the cows with advancing age. At any rate, there seems to be a parallelism between the two sets of figures for the same cows. Young animals use a portion of their food for the formation of body tissue, and it is to be expected, therefore, that heifers will require a larger proportion of nutrients for the production of milk and butter-fat than do other cows. After a certain age has been

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reached—on the average, seven years —the food required for the production of milk or butter fat again increases, both as regards dry matter and the digestible components of the food. A good milk cow of exceptional strength, kept under favorable conditions, whose digestive system has not been impaired by over-feeding or crowding for high results, should continue to be a profitable producer till her twelfth year, although the economy of her production is apt to be somewhat reduced before this age is reached.

◆

Capped Hocks.

A veterinary surgeon is reported to have devised a curious method of treating capped hock which was said to give satisfactory results. His plan was to apply a bandage of strong canvas very tightly round the hock so that each turn came over the point. The horse was then required to move, but if the bandage had been properly put on he could not flex the joint, except very slightly, and the horse moved with the limb extended to rear. After taking about twenty steps the horse was stopped, when he would make violent efforts to get rid of the bandage, which he would eventually burst by flexing his hock; and when he accomplished this, it was maintained that the enlargement would be found to have nearly disappeared. The inventor's idea was that the great pressure ruptured the swelling internally, and the matter contained therein was dispersed into the surrounding tissues and absorbed.

◆

A Day's Work for a Horse.

The capacity of a horse is the power of endurance within the limit of losing flesh. Whenever a horse begins to lose flesh he is being worked beyond his capacity, and it is only a question of time until he will seriously fall behind a full day's work. This capacity may fairly be placed at eight hours when the whole year is considered. Another way of reaching the capacity of a horse is to consider what the average work amounts to. Farmers as a rule do not cultivate more than six acres of corn per day, and, allowing the team to travel at the rate of two miles per hour, including the time for turning, it would require but about six and a half hours, at the same rate of travel, to plough two acres, cutting a 14-inch furrow, or, in other words, a team must travel a little more than thirteen miles to perform what is ordinarily recognised as a day's work, or eight hours' work would require that a horse should travel but a fraction over a mile and a half per hour in doing the average day's work.—"Farm, Stock, and Home."

◆

Pig Feeding.

Results of experiments in pig-feeding at the Utah Station, U.S.A., extending over two years, justify the following conclusions:—1. Pigs allowed to run at large over eighteen acres of good pasture and fed a full ration of grain made the most rapid growth and required the least grain for one pound of gain. 2. Pigs confined in movable pens in the pasture grow more slowly than those running loose, and required an increase of 20 per cent. of grain to make one pound of growth. 3. Pigs at pasture, fed under three different conditions, gained 92.5 per cent. more, and ate but 2 per cent. more than the pigs getting grass and otherwise similarly fed, but confined in pens. The grain required to produce one pound of gain was increased over 40 per cent. with those in pens over those at pasture. 4. Pigs fed but part rations of grain at pasture made satisfactory gains. Those at pasture getting the three-fourths grain ration gained more than those fed a full grain ration and grass, either in the yards or in the pens. 5. Pigs pastured without grain made about the same growth for three seasons in succession, thus averaging .36 of a pound per day. 6. As nearly as can be judged, exercise alone increased the gain 22 per cent., and the amount eaten but 1.5 per cent., but decreased the amount required for one pound of grain 22 per cent. 7. Grass when cut and fed green to pigs, whether fed in pens or yards, or with full or part grain ration, or without grain, proved to be of very little value. 8. Pigs confined in pens and fed on grass alone, mostly lucerne, for ninety-one days, lost over a quarter of a pound per day. 9. The average of the pigs fed on grass gained a little more than those without the grass, but not enough to pay for the extra feed in the grass. 10. With the pigs confined in pens the grass proved beneficial, while with those in the yard it proved detrimental, the latter requiring more gain to make a pound of pork with the grass than without it. 11. Pasturing either with full or with part grain rations appeared to be by far the cheapest and best way of making pork. Note—The grass is a mixture of eight varieties, in which lucerne constitutes at least one-half.

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The Cow Pea.

The cow-pea has not arrived at the stage of playing the same important role in agriculture in this country that it does in many parts of America. The cow-pea is a leguminous crop grown for forage, human consumption, and the renovation of the soil by the most modern and approved system of gathering nitrogen from the atmosphere. It is more of a bean in character and appearance than a pea, being closely allied to the well-known haricot bean of domestic use. The pods of different varieties vary from about 4 to 16 in. in length, and the peas from kidney shape to small, round pea forms. The peas are all colours—white, black, red, brown, and intermediate shades, and are often mottled and speckled. A few varieties ripen seed in sixty days from the time of planting, whilst others require from eight to nine months. Between these extremes there are all grades. In parts of the United States a yield of from two to three tons of cured hay per acre is quite common. Seed is yielded at the rate of from twenty to forty bushels per acre.

The cow-pea requires a warm, moist seedbed. The ground for the crop requires to be well ploughed and harrowed and the surface brought to as fine a tilth as possible. When sown in drills the rows are made from 18 to 30 in. apart, depending on whether the smaller or larger varieties are grown. The seed should be covered about 2 in. deep, and on no account planted too early while the ground is still cold and wet. Experience goes to prove that the increase in yield of both seed and hay obtained when the seed is drilled in is more than sufficient to pay for the additional expense of drilling as compared with broadcasting. When the crop is sown broadcast and harrowed in, it requires no further attention in the way of cultivation. It needs, however, a greater amount of seed, the growth of the plant is less vigorous, and the crop is not so easily cut if wanted for hay as when the seed is drilled in. When seed is plentiful and labour scarce it may be better to sow broadcast. The most economical way of using cow-peas is to feed the vines and peas to stock. As hay, it is about equal to good lucerne in feeding value. It is especially rich in blood-, bone-, and muscle-making material. Pigs do especially well on cow-peas. An acre of ripening peas will pasture from fifteen to twenty young pigs. Where it is intended to turn the vines under for green-manuring, it is advisable to first pasture with pigs. The droppings will enrich the soil, and at the same time a large amount of firm pork of excellent quality can be secured. Pigs also relish the cured hay, and it can be fed to fattening pigs in addition to their allowance of grain. Cattle and sheep are liable to bloat if allowed to eat ravenously of the green vines, but, as with lucerne, if the vines are cut and allowed to wilt all risks are obviated.

Opinions differ as to the value of the cow-pea for ensilage. It is generally regarded as inferior to green maize or sorghum, and is much more liable to spoil. In the feeding of pigs it has been proved that much more lean meat is produced as compared with a diet of grain. As ensilage, the vine has been successfully substituted for wheat bran when feeding dairy cows. Seven pounds of such were considered equivalent to one pound of bran. In several instances it has been reported that a change back to bran has resulted in a loss of 25 per cent. in milk and butter-fat.

Owing to the rank and succulent nature of the cow-pea it is somewhat difficult to cure into hay. The vines are cut for this purpose when the first pods begin to ripen. Vines which have been cut in the morning and well forked in the afternoon are usually dry enough to put into small cocks the next afternoon. They should be left out in the open two or three days before being hauled in for stacking. A light rain does very little damage to the hay. The essential point in making the hay is to avoid handling the vines when wet. Although the hay is cured it still contains an amount of moisture. It is therefore desirable not to pack it too closely, but to allow room for the escape of heat and moisture.

For use as green manure the best results follow mowing the vines and allowing them to wilt on the surface, ploughing them in later on. Turning the vines under green has been proved to give the poorest economic results of all, save on soils of heavy clay. The heavier the crop turned under the greater the beneficial action on the mechanical condition of the soil. On sandy soils which are already too light the vines should be left on the surface to decay. It has been proved that an average crop of cow-peas turned under will add to the soil more than 110 lb. of nitrogen per acre, having (in America) an actual cash value of £2 16s. Besides this direct addition to the soil of fertilizing material, the crop renders available for the use of succeeding crops about 24 lb. of phosphoric acid and 100 lb. of potash.

The advantages of growing cow-peas are thus briefly summarized by an American scientist:—(1) The vine shades the soil in summer, and leaves it friable and loose for a future crop; (3) it has a large root development and draws moisture from a depth and with it the mineral matter needed by the plant; (4) it is adaptable to any kind of soil—stiff clay to porous sand, alluvial flats to barren uplands; (5) it stands heat and sunshine; (6) its rapid growth enables two crops a year

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to be grown on the same soil; (7) when sown thickly it smothers all weeds, and thus acts as a cleansing crop; (8) every kind of crop grows well after it; (9) it is good food for man and beast.

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From Grade to Pure Breed.

The question has often been asked how many crosses of pure blood will entitle the descendant of a crossbred to be described as a pure-bred? In these days of flock and herd books the question is a necessary one in order to decide what animals shall be admitted for registration. The number of pure crosses in the pedigree of a candidate for admission to registration differs in various breeds, and in some instances no number is mentioned. The settlement of this matter is of considerable importance as registration gives an animal a certain value and standing for stud purposes, and that value and standing are appreciated by buyers of breeding-stock. In some instances it is accepted that five crosses to the pure blood from an ancestor that was a high-grade and not a crossbred, to all ntents and purposes constituted an animal pure bred. That number of crosses from a half-bred would give 63 64ths of pure blood. The proportion of foreign blood in an animal so bred would be so small that many stock-breeders would be inclined to regard it as a negligible quantity, and on paper to be as good as a pure-bred. But how would an animal so bred stand the test of a stud experience? At what point can we say for certain hat atavism, by reproducing the foreign strain, ceases to be manifested. In considering this question we are met by some very curious facts. Take, for instance, the common experience of a black lamb appearing n a flock from countless generations of the white type. This shows how mpossible it is to always completely eliminate a foreign strain. The reappearance of the characteristic of a foreign breed 100 years after it was ntroduced has, of late, given rise to a distinct variation in the polled Durhams of the United States. These hornless Durhams are descended through the Gwynne family from the grandson of Bolingbroke, whose grand-dam was a red Galloway cow. It is the polled type of the old cow cropping up after a century that has established the new variety which American cattle-breeders have had the sense to render permanent. Where two varieties of the one breed are mingled, and the after-breeding has been always to the one type, the other has been known to appear after the attempt to eliminate it has lasted thirty years.

It is extremely difficult to say when a breed with a stain in its pedigree can be guaranteed to be a pure race, but for practical purposes it is advisable to fix a limit, though how many crosses should be considered as a safe limit is more than I would like to say. The matter should be taken in hand by the breeders' societies, and some finality arrived at.—"Australasian."

◆

The Value of Trees on the Highway.

The following thoughts on the value of trees on the highway are from a paper read before the Illinois Horticultural Society by T. J. Burrill, chief in Botany and Horticulture at the Illinois College of Agriculture:—

"The commercial value actually added to property may often be much greater from ornamental trees than any common agricultural crops ever yield in total through a series of years. With all of our shortcoming in regard to the planting and care of trees, there are in every town of 5,000 or more people in Illinois specimens which would not be parted with for 1,000 dollars apiece. In numerous instances town lots have sold for double their value because of the trees someone else has planted. The following illustration is not an unusual case. Two lots were offered for sale on the same street and essentially similar in every way except that in one case there were four trees about 25 years old, two in the street and two inside of the sidewalk, while in the other case the only trees were outside the sidewalk, and these were less than half the age of the others. The prices asked were respectively 2,500 and 1,500. A man wishing to build a home for himself compared the two lots and decided in favor of the former—1,000 dollars for four trees, or we might say for two trees—in connection with a lot of 66 feet frontage and containing about one-fourth of an acre. On such an area the net profit for twenty-five crops of corn might perhaps have been 25 dollars. If so each crop would have received more care than did the trees during the whole of the twenty-five years.

"The comparison of 1,000 dollars to 25 dollars is instructive, yet there are to-day more than twenty-five to one persons of intelligence who in looking forward for results will prefer to trust the corn. This must always be so until men find themselves well established and until experience in the past may confidently be used as a basis upon which to judge the future.

"It is the wise man, the thoughtful man, the trustful man, the man of large veiws and of clear perceptions to whom we must look for successful tree planting. As we grow older as a people, as we gain in culture, as we come more ully that there are possibilities of enjoyment in life higher in kind than whose of eating and drinking or of ostentatious exhibition of wealth, we shall plant more trees for ornament and especially for the decoration and better utilization of public grounds and thoroughfares, and we shall in some way find methods by which they can be much better cared for.

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Study the Trees and Shrubs.

It is not late yet to take note of the trees and shrubs in one's immediate vicinity to help to a decision of what to plant in the near future. In fact the faculty of careful observations becomes a pastime as well as a duty, and the results can be brought into actual use whenever the call comes. It is time to begin serious thought as to what efforts shall be made to cantinue the work of out-of-doors improvement for the next season, and past study of the local plant life will greatly help towards final decisions. Besides careful observations, the practice of note-making should be strenuously pursued; a few words in the note book as to form, habit, color, etc., of trees, shrubs or plants that strike the eye, soon make an encyclopedia of useful information, personally gathered, that will help in the creation of original effects, an end to be earnestly sought by all home and neighborhood improvers.—"Landscape gardening."

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The Colour Black.

Black is a color to which scores of men who are associated with stock have a rooted objection. Few are very sound as to the reasons of so pronounced an objection, being usually satisfied to fall back on the statement that they "dislike it on principle." This as an argument is somewhat lame, seeing that, in the literal sense of the word, there is no principle involved. Yet at the back of this hostility there really lies an intelligent, scientific explanation. Many a stockkeeper on a northern cattle station professes a virtuous horror of this color among the quadrupeds under his charge. The same man's opinions as to the value of the color among bipeds are frequently more catholic, but need not be included in detail here. Men of this class hold to the creed that black heifer calves should be knocked on the head "quick and lively," and if unrestrained by owners, would pay the same attention to their mothers. In the only fitting destiny for all young males of the same color is early castration, with a view to later pickling for home consumption. They spoil the look of the herd, and should never be sent off the run for sale as beef. Nothing black should be allowed to breed, and nothing black permitted to travel. Even when cattle are otherwise color-perfect—red, white, strawberry, or roan—the possession of a black muzzle is regarded as an abomination, and as indicative of an exceptionally wild disposition. The black polled Angus, so much revered in Scotland and elsewhere, has no admirers in the backblocks. One southern enthusiast did once venture to send up a couple of bulls of this breed to his northern station. They were not allowed to reign long. The scorn of some stockkeepers was aroused to such a pitch at the prospective insult to all long-established notions that they came to an early and untimely end by means of a Winchester rifle.

Among sheep farmers similar opinions prevail, but the degree of hostility is less remarkable, possibly because black wool invariably meets with a ready sale. This fact has never been properly appreciated in this State, but in Queensland one well-known pastoralist has made a speciality of black merinos. A few years ago his flock numbered 15,000, and presumably it is still going strong. The average sheep farmer goes to great trouble to exclude the color from his flock. A ram to which responsibility for an unseemly proportion of black or spotted lambs can be traced usually has his career as a sire expeditiously terminated.

Among horsebreeders in this country this color is unpopular, though among Clydesdale and Shire horse fanciers a pedigree that can be traced back to the Black Horse period is greatly respected. Those who have most to say against black as a desirable color for horses are those who are owners, breeders, or trainers of thoroughbreds. The color has never been able to establish a great reputation on the turf. Even the horse-loving Arabian, who bred for purposes quite distinct from racing, places the color low down on the list. The turf records of this country place few classic events to its credit. An occasional exception can doubtless be cited, but taking the Melbourne Cup as a standard of Australian high-class racing, the performances of the color are fatally discouraging. No teamster is partial to a black bullock in his team, but, unlike the stockkeeper, he can give the true reason of his objection—"because the beggar cannot stand the heat." Bullock-drivers are not necessarily the most observant of bushmen, but in advancing this reason they concur with the explanation given by the scientist. Of all colors black absorbs heat most rapidly, and radiates it most freely.

Experiments have proved that the soil is similarly affected. If a patch of soil be made white by covering it with a thin layer of magnesia, and another alongside of it be strewn with lamp-black, the difference in temperature between the two will be as much as 12 or 14 degrees. The experiments of Franklin are familiar in which pieces of cloth were laid on snow. After a while it was found that the snow had melted most beneath the black cloth. In countries that are subject to severe winters, other things being equal, it is the frozen ridges of black soil in the ploughed fields which are first seen to emerge from beneath the snow in early spring. On the Rhine grapes are said to mature best where the soil has been covered with fragments of black slate. In parts of Switzerland, where summers are of very short duration, and it is of great importance to save time in getting the seed into the ground, black earth is sprinkled over the snow to accelerate its solution. The simple process of sprinkling the surface with black earth makes the snow melt many days sooner than it would otherwise do. It is at best a tedious labor, and has to be renewed if any fresh snow should fall.

In a series of experiments upon potatoes on a given date twenty-six varieties planted in a black soil were found to be ripe, as against twenty varieties in a sandy soil, nineteen in clay, and sixteen in a white limestone soil. It is a matter of familiar observation in the spring at the South of France that chalk soils are cold and late, because of their white color. It is also noticeable there that fields and vineyards, which are of reddish or yellowish color are warmer than white fields or vineyards similarly situated and equally well supplied with moisture. An experiment was made with a white clay soil; in its normal condition it showed a temperature of 106 degrees, whilst when blackened the temperature rose to 120 degrees. In the matter of soils, the influence of color varies according to

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the time of year and the time of day. The greatest differences have been proved to exist when the temperature of the soils is highest. During the colder seasons the differences in temperature between dark and light colored soils are less emphatic. Black soils cool off more rapidly by night than the light-colored soils, although the temperature falls no lower in one than in the other. By the time the temperature of the twenty-four hours has reached its lowest point, all difference between soils of different colors will have disappeared. Where, as in Australia, the desire is to discourage the absorption and radiation of heat, one can readily appreciate the unpopularity of black. So long as it is regarded as the emblem of grief, and is closely associated with funereal woe; it must ever command respect; but even under these circumstances it has little to commend it from a utilitarian aspect in a land where high temperatures are more in evidence than low.—"Elder's Review."

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Rough on the Feet.

It is scarcely a matter for wonder that so many horses go wrong in their feet, when the results of careless or incompetent shoeing and the amount of usage the hoofs experience are considered. Even horses which are driven slowly are subjected to almost as much risk from the effects of wear and tear as is the animal which moves faster; for, though the latter, and especially if he happens to be a high-mover, places his feet down harder than the other, the slow mover puts them down considerably oftener. It has been caluclated that a horse working at a slow pace will move his feet up and down over eleven million times in the course of a hard day, and about eight million times during a moderately hard one; whereas an animal worked at a trot puts down his feet some seven million times if he has a hard day out, and about half as many in the course of a moderately hard one. Assuming that these figures are worthy to be accepted—they are the work of an eminent veterinary authority—an idea will be derived from them of the risks of concussion to which horses are liable, with the possible result that some owners will devote more attention to the treatment of their animals' feet, especially if they work on hard ground.

Clean Food.

The importance of providing horses with clean food is very rarely overlooked by practical men who are solicitous as regards the well-being of their charges, but far too many people are either careless or ignorant on the subject. Horses in the ordinary way have to consume quite as much dirt as they can manage to digest without incurring additional risks to life or health by eating sand or such-like substances with their corn or hay, and consequently the quality of such articles in the first and the proper storage of them in the second instance should be the care of every horse-owner. Most people who have large experience of horses know what the effects of dust-balls in the stomach are, and how many animals lose their lives every year through the calculi which have formed inside them, some of these obstructions having assumed almost incredible proportions. Their origin is often due to quite an insignificant "something" which finds its way into the stomach, lodges there, and affords a hold for other substances to gather round. The great racehorse, Robert the Devil, for instance, died of a calculus which, when opened, contained in its centre a minute piece of zinc, which the horse had, no doubt, nibbled off his manger, and his fate affords a proof of how careful owners should be to prevent, so far as they are able, their horses swallowing gravel or pieces of stone or metal.

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Bran Mash.

Mash is a common feed for horses by all good horsemen, but all do not take the pains to make the mash properly. An old horse-feeder says that to make a good bran mash first wash out a bucket with boiling water, then pour in the quantity of water required, say, three pints, and stir in three pounds of bran. Cover up and leave it for a couple of hours, or more if not required for immediate use. A mash takes four hours to get cold, and is often given to a sick horse too hot and refused when it would have been taken if properly prepared and given warm instead of scalding hot. The addition of a tablespoonful of salt in the ordinary mash on a Saturday night can be recommended to keep down parasites and promote digestion, but should not be part of a sick horse's diet unless specially ordered. A mixture of linseed and bran is often prescribed hot as food and a poultice. To one part of linseed two of bran is a desirable proportion for both purposes. To get all the feeding value out of linseed, several hours should be allowed for cooking, not merely infusing as with a bran mash, but gently simmering on the side of the stove. The vessel should be filled, and toward the end the lid may be taken off and evaporation permitted while cooking.

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Roseworthy Agricultural College.

Principal's Report, 1911-1912.

The Principal (Professor A. J. Perkins) presented his report for 1911-12, as follows:—

Mr. Minister, Ladies, and Gentlemen—

To-day brings to a close the twenty-seventh scholastic year of the Roseworthy Agricultural College. Over this period of time 557 young men have enlisted under its banners, and after the completion of to-day's ceremony, 182 will have been awarded the College diploma. Our chief object this afternoon is to do honor to those who in the past three years have, by their steadfastness and good work, earned the right to inscribe their names in the list of our successful students. And at this stage, let me state, on behalf of the institution as a whole, that we feel highly honored by the presence of those of our friends who have been able to respond to our invitation.

Before entering on the real business of this meeting I shall crave your indulgence for a few moments to make reference to a few matters bearing on the general aims of this institition. I think that I am justified in saying that we are living in a day in which what has been termed "agricultural education" is receiving quite as much attention in our midst as fell to the lot of "manual training" some 20 years ago. And in the position of the man at at the helm in a purely agricultural institition, I may be supposed to rejoice in the popularity of this "war cry" of our educationists. In effect, whilst I must admire the sentiment, I cannot agree with the direction in which it would appear to be driving us. It is more or less tacitly taken for granted that the early education of the farmer and rural worker should be something quite different from that which slowly leads his city-bred cousins to efficient citizenship; in brief, that what mental training is bestowed upon him should be in keeping with his natural pursuits. I regret to say that I cannot see my way to subscribing to this popular proposition; to my mind early education and technical training are two things apart; education makes the man, technical training the craftman. And just as the former should precede the latter, so I can see no advantage to the State that one should be allowed to encroach upon the other. I have, for instance, often seen is stated that agriculture should be taught in all country schools. In my view this cannot be done, and if it could, should not be done. It is overlooked, I suppose, that only a past master in his art is capable of imparting it to others in an elementary fashion without departing from the narrow path of scientific accuracy. Is it reasonable, therefore, to expect that the average country school teach agriculture to the sons of farmers? No doubt there is much connected with the natural science that he can, with great advantage, impart to his scholars; but to call this agriculture is a wilfully misleading perversion of terms. But, apart altogether from this aspect of the question, if agriculture of a kind is to be taught in elementary schools, it must necessarily displace some other subject of general knowledge, upon which the rural worker has quite as much claim as his city cousin. My own view is that in a country in which education is free the scattered and isolated country population is entitled to exactly the same educational facilities that obtain in the cities; whatever the use that is made of them, there should, at all events, be equal opportunities for all. In this connection I hail as a step in the right direction the opening of high schools in country centres. Their number, it is true, is as yet very small, and I sincerely trust that the worship of numbers and overflowing attendances will not check the early extension to our more isolated districts.

But if modern public sentiment is awake to some of the educational needs of a country population, I am afraid that higher technical training that should follow sound education has not yet succeeded in awakening that degree of enthusiasm that it undoubtedly deserves. Indeed, I am inclined to think that there are many who imagine that the overtrained farmer is more likely to fail than succeed . After all, the farmers' business is so simple a matter—he ploughs and sows and reaps, and he eats and drinks and sleeps, and there apparently end both his functions and bodily and spiritual requirements. (Hear, hear.) As a matter of fact, as many have learnt to their cost, the management of land is an art calling for quite as long an apprenticeship as any other of the human arts; and nowadays it is not merely skill in manual operations and some of the attributes of a weather prophet that make the successful farmer. In the management of land probably the element that counts most is personal experience which time alone can confer, and hence it is rightly prized by those who possess it. On the other hand, how much more readily is this experience acquired, how much more dependable will it prove, if adequately backed up by good technical training? Other things being equal the trained mind is more receptive to the experiences of life. It notes, analyses, classifies, and, finally, concludes, and its conclusions are more likely to be correct than the instinctive views of empirical experience. No doubt at times the men with the best of trainings fail and become a byword to the shallow minded. I am persuaded, however, that the failures of the untrained are far more numerous. We hear less of their failures, because they are less conspicuous, and fall from lower heights.

There is a feature in training that is often overlooked, and which to my

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mind makes of it an invaluable asset to the country dweller. The measure of our enjoyment of life is, I suppose, in proportion to our knowledge; and if there is anything that can relieve routine work of its drudgery it is, I think, the knowledge that is acquired in the course of technical training Uuder its guidance work, whatever its monotony, becomes a series of intelligent acts leading to endless combinations, which the trained mind finds a pleasure in following out and unravelling. The man who pitches his tent in the wilderness and sets about tilling the soil is thrown back on his own resources for the relaxations and recreation that are essential to all minds, and to my mind his enjoyment of life and his satisfaction with his lot will be very largely proportional to the fulness of his mental training.

This technical training, need I say, has been the object of this instntution during the past 27 years to impart to young men who are now scattered over the fourcorners of the State. Our one regret is that unfortuately hitherto economic conditions appear to have hindered the sons of farmers from taking full advantage of what we believe we have to offer. If, however, our efforts have been very largely spent upon the city-bred, hitherto they represent so many brands snatched from the turmoil of city life never again to return thither. (Applause).

I need not here refer to the results of the agricultural year, since at more opportune times it is one of my duties to inflict upon the public long reports on this usbject. It will be sufficient to state that with us it has been on the whole a lean year. The grain crops, with the exception of barley, were generally below expectations, the hay crops moderate, and the grape crop a complete failure. Overlooking the incidents of the weather and the season let us say that we have here one of these partial failures of the over-trained.

I wish to draw attention to various improvements that have been carried out at the institution during the past year,which we owe to the interest shown us by the late Government, and, particularly, by the late Minister Stabling accommodation has been extended, we have been given a magnificent grain room, the students have benefited by a gymnasium, and the house staff has been given commodious quarters. (Applause.) There is only one fly in the ointment, however, which I must not overlook. We have recently been given a practical illustration of the shortage of bricks. The house of a member of the staff is in course of construction; a wood framework has been erected which is, I believe, to be covered with cardboard or some such material. (Laughter.)

It is now my pleasing duty to congratulate those students who are about to be awarded the College diploma. I have no hesitation in stating that they have well earned the distinction by strict attention to their work; and I may add that very rarely has it been my lot in the course of my twenty years' experience as a teacher to be associated with a body of young men who as a body have shown greater anxiety to become possessed of what information I have had to offer. I wish particularly to congratulate the gold medallist, Mr. G. C. Love. In our record his diploma percentage—88.73—is second only to that secured by Mr. W. R. Birks in 1909. (Applause.) I must also congratulate Mr. W. D. F. Clark, whose diploma percentage has been exceeded on only three occasions in the history of the institution. (Applause.) The general diploma average for the whole class—practically 69—is not quite as high as we have been accustomed to of late years. This is accounted for very largely by the greater number that have on this occasion been successful in securing their diplomas. Only on one occasion—in 1902—have fifteen diplomas been awarded in a single year. I must also express my satisfaction with second and first year students. If they continue as they have begun I feel certain that in 1913 and 1914 respectively, they will bring added lustre to the college results. (Applause.)

And now, before resuming my seat, I shall take advantage of the few brief moments of authority that remain to me over those who are about to leave us to offer them a few words of advice. You are going into the world, and many things will be expected of you—some reasonable, some unreasonable; pay little heed to the expectations of others, except as a stimulus to renewed effort; do your duty; satisfy yourself, and you will satisfy all those who are worth satisfying. (Applause.) Be great observers, great listeners, particularly of those who have got what you have not yet got—personal experience. You may be possessed of more knowledge than some of your neighbours; keep this knowledge of yours in the background until you have been able to put it to the test of personal experience, because unripe knowledge is often a source of offence to others. When you are sure of yourselves use your knowledge freely, both for your own advantage and that of your country. (Applause.) Do not be afraid of failures; no personal experience worth the name was ever built up except by the skilful use of a series of personal failures. Beware, on the other hand, of successes that come too easily. There is always an element of luck in them that may not prove equally propitious on the next occasion. Wherever you may be placed never omit to make due allowance for change in conditions. If you go into districts that are new to you, or find yourself surrounded by unfamiliar conditions, assume that you know nothing, and for the time being become learners. Again, be persevering, continue through your lives students of men and things; be brave, and there are no obstacles that can mar your careers. (Applause.)

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Ambling.

For a road horse what bushman does not like a creature that can amble? The motion is a very comforting one for any rider, and a welcome change from the walk—the compulsory pace of all who are bound on a long-distance journey. A good walking horse is an acquisition at any time when the distance to be traversed is great, but a horse that can amble, and has an equally easy canter, is the ideal hack for a journey of three or four days' duration. Horses that can amble well are very scarce, and when met with in this country as often as not have acquired the gait without undergoing any special instruction. They may be said to amble naturally, and when such is the case they rarely, if ever, trot. Many a good old horse that has been overworked, and is on the decline, prefers to shuffle over the ground at an ambling gait to any other kind of rapid pace. It would thus seem as though this pace was an easy one to the horse, but it is generally recognized that the reverse is the case, that the amble is very fatiguing to the horse, and that it cannot be kept up as indefinitely as in the case of walking. This pace necessitates a horse keeping his feet much nearer the ground, and in consequence the risks of stumbling are greater, especially where the surface is uneven, and when the animal is becoming leg-weary, and gradually slackens its pace the horse moves alternately his two right legs and his two left. He maintains no proper equilibrium between his two sides, but supports himself by a rolling gait from side to side, and is in consequence compelled to practice greater agility. He not only lifts his hindleg simultaneously with his foreleg, but sets it down from a foot to eighteen inches in advance. The further the hindleg extends beyond the spot on which the foreleg grounded, the more easily does the horse amble, and the more rapidly does he get over the ground. It is an exceptionally easy pace for the rider, and will land him at the end of a comparatively long journey in a fresher condition than if he had walked and trotted. But it is a pace that cannot be kept up continuously. In a trot the foreleg resists the lifting up of the hindleg, and occasionally causes a jolt or a certain amount of roughness to the whole of the horse's motion. In the amble the foreleg moves so simultaneously with the hindleg as to offer no resistance, occasion no jolt, and render the whole motion smooth and flowing, the horse seems to "oil" along.

Of course, there are men who can train good hacks out of all manner of raw material, but they are not usually to be met with in the bush. They belong rather to the circus and the riding-school, where American notions, sidelines, weights, and hopples successfully create strange movements for both harness and saddle horses. The bush lover of the horse who lays himself out to instruct his hack as to the best method of comporting itself will act wisely if he selects material that shows some natural proclivities towards the desired pace. Various methods of discipline can be practised for bringing a young horse to amble. Some try the method of wearying the animal in his foot pace through newly-ploughed land, and compel it as a means of relief, to lift alternately his two right feet and his two left. As they are apt to weaken the animal, to lame it or to bring on an attack of stringhalt, this system cannot be satisfactory. Others attempt so to stop the horse in a gallop or trot as to throw it accidently in to the ambling pace. They may, however, spoil a good mouth, or the sinews. American instructors encause an overreach, or straining of cumber the horse with very heavy shoes, or with thick pieces of lead about the pasterns, intending to force the horse into an ambling motion by the mechanical action of the weights. These expedients are also risky, and may lead to straining the hocks or the pasterns, or both, and the weights resting on the coronet may set up ringbone. Another method is to make the horse amble unmounted, driving it with long reins, and by manipulating the mouth and using a whip at certain moments gradually coax it into the desired movement. An experienced horseman can at times establish an amble by means of leg-pressure on the flanks at the right moment and by gentle manipulation of the mouth. Encouragement will result in maintaining the movements, and practice will establish it as one of the horse's recognized paces. Usually, however, the first symptons of a disposition to amble must come from the horse. Following on that the rest is easy for a rider with good hands in sympathy with his mount. The amble is natural to the elephant, and in some countries to the mule and the ass. It is a pace that was in the past associated with the journeyings of fat abbots. When the modern station-owner or manager acquires the proportions of the jovial priest he usually takes to a sidebar buggy, and evinces as much interest in the action of the springs as he once displayed in that of his favourite saddle-horse.—"Elder's Review."

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Poultry Notes.

Poultry at the Royal Show.

By M.H.L.

The 1912 March show was practical evidence of the unreliable fertility experienced by breeders generally in the early part of the past breeding season, the record being some thirty odd entries short of last year's total. The most conspicuous feature of the show was the absence, except in a few isolated cases, of the mere chicken, so prominent in previous shows. Especially was this noticeable in the Malay section, which comprised about a quarter of the total entries—all well-grown, good-conditioned specimens—a great credit to the enthusiastic members of the Malay Club, whose president, Mr. W. H. Brown, secured both the clubs' certificates with two magnificent Black Reds. It was regretable that no turkeys or geese were exhibited. The weather was cooler than usual, and the birds did not suffer any great discomfort. Right through the show they seemed well contented.

Mr. J. H. Hobbs judged in the majority of the heavy breeds, Mr. Geo. Duncan in the Game, Malays, and Bantams, while Wyandottes, all the light breeds, and Ducks were left in the capable hands of Mr. S. Cope. Dissatisfaction with the judging was the exception, and it was pleasing to note the kindly reception accorded the judges' awards. What a difference a contented lot of exhibitors make to the pleasure of a show.

In Dorkings W. A. Jones secured all the coveted honors with birds of good type, but failing in color. This breeder, so it is reported, secured Mr. Gabb's best birds last year. They have evidently gone into capable hands. Langshans were not up to usual. Where are the old breeders of this variety? Messrs. Crage and Reddy in cockerels, and C. W. Bailes in pullets, secured first honors with good type birds, but very young. These birds should command a place in the June Show. Plymouth Rocks made a brave show—sixteen entries in the two-barred classes. In cockerels Crage and Reddy scored first, and E. McLeish second with well-grown birds, but wanting in type. Manuel and Brown showed two youngsters of exceptional promise, good type, and grand barring; they were, however, too young. They will take a good bird to put them down in June. It is, however, reported that a Sydney buyer is in love with them, so it may be they will not again face an Adelaide judge. In pullets Manual and Brown won all cards easily with great birds, the first especially a clinker for type and barring. White Rocks, in which Manuel and Brown were the sole exhibitors, will need a lot of care to breed them to the true Rock type. Black Orpingtons were of good quality, F. J. Wimble getting all places in both classes with good birds. The winning cockerel was not, however, equal to his winner of last March, but I understand his best were left at home, as they are to challenge Sydney's best at the great show there. His three pullets were all good. My preference went, however, to the second bird; she was closer feathered, and equally good in type and color, though slightly higher in leg. In Whites Manuel and Brown secured all honors, with the exception of third in pullets, which went to F. J. Wimble. The winners were good-bodied birds, but a little too high on leg. Buffs—Very indifferent, both in type and color. A. Eldridge was the principal exhibitor and winner in Silver and Golden Wyandottes, showing some good birds. In Whites the winning pullet, shown by S. Oliver, was extra good. One missed Mr. Gibson's entries in this variety. Dr. Coombe was the only exhibitor in Flaverolles—good birds, but not sufficiently developed. In Modern Games, Black Reds only were entered, H. W. Hopkins being the successful exhibitor with good specimens. Old English Game fell to one entry in each class, by D. Cruickshanks. Only one entry in Indian Game—a nice pullet. What wonder that Mr. Duncan asks: "Where are the Indians?" The Malays made a great show; never has there been a finer exhibit at the March show. The judge's remarks on this variety are interesting. He said: "Black Reds above the ordinary. Winning cockerel will make into an exceptionally good bird; third bird more reachy, but not ready. In pullets the winning bird of wonderful type, not quite the reach of the second, but better in head. Brown Reds, good quality; third cockerel out of condition, but will make a clinker. Pullets of good type, and promising. Blue Reds nearly all young chickens. Pile pullets were exceptionally good birds. White cockerels were all passed out, not being pure Whites; pullets were only youngsters, but of good type and reach. Duckwing cockerels were fine grown birds, and should make up well. Winning pullet young, but full of quality. Any other variety, good classes, especially in pullets."

The principal winners in Malays were W. H. Brown, A. Baker, Herriman and Packer, W. Kay.

Minorcas.—H. W. Hopkins only exhibitor, but with good type birds. White Leghorns had good classes, W. C. Bennett's winning cockerel was a nice bird of good type and color, and

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neat in head. F. Lambden, who took both first and second in pullets, has two good birds, and a further one in his winning brown pullet. Among those anxious to view the Rhode Island Reds, there must have been much disapointment, as the two birds on view were the merest chickens. Two nice light Brahmas, entered by C. Colmer, won both the A.O.V. classes. Bantams showed good all-round quality. D. Cruickshanks won all firsts in Black Red and Pile Modern Games; his Black Red cockerel was a nice little bird ,of splendid type and reach. In Duckwing cockerels F. Goodwin won in a strong class. Naismith and Hill were the chief winners in the Japanese classes, with nice birds, but wanting in age. The same exhibitor's winning Rosecomb cockerel was a little beauty, bred, I am informed, from a New Zealand importation. D. Cruickshanks showed two nice Sebrights. Only fifteen ducks in all classes faced the judge. Manuel and Brown were the only exhibitors in Pekins, with grand birds. P. J. Whittney penned two very nice Rouens. Sargenfri Poultry Yards had a fine exhibit in Runners, with three birds in each class, all of which were a credit to these old-established yards.

In the Boys' Classes there were fifteen exhibits, Ed. Jones winning with a Silver-Grey Dorking cockerel, and G. D. Cruickshanks in the pullets with a nice little Pile Game Bantam. Table Poultry could only command three entries.

Mr. Geo. Duncan, besides his remarks above quoted on Malays, informed me that the Modern Game, though few in numbers, were very promising. He was very disappointed with the absence of Indian Game; the one pullet shown he considered good. In Bantams he thought that the exhibits should make up into good birds, the Black Reds and Piles being the pick of the Game, while in the variety the Japanese and Rosecombs contain birds having the making of future champions.

Mr. J. H. Hobbs said the Dorkings were only medium; type good, but color poor. In Langshans he considered the birds showing good type were too young, while the older birds were altogether lacking in this respect. He found in Barred Rocks two good classes, and was much impressed with the great promise shown in two cockerels, which, however, were too young to be judged. He thought the three winning pullets very [illegible] in type and barring; the other pullets did not show the same quality in barring. In Orpingtons he found good classes in Blacks; the cockerels were not sufficiently finished, but the three winning pullets were the best he had ever seen at a March show. In Whites the winners were very fair; tendency to too much length in legs. Buffs were very poor.

Unfortunately, I was only able to have a very few words with Mr. Cope. He had quite fallen in love with the winning White Wyandotte pullet. He considered her something really extra good. He was taken also with the winning white cockerel and Silver pullet. In Leghorns he considered both the first and second White pullets worthy of particular note, and as something very typical he commended the winning Indian Runner drake.

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Why Some Men Fail.

From "Poultry."

One has only to get into conversation with some of the successful poultrymen—though many are difficult to "draw," as they are somewhat loth to tell others how to equal, perhaps beat, them at their own business—to realise that there are many who to-day are largely depending upon their fowls for a livelihood. To tell such men as these that poultry do not pay is to run the risk of being ridiculed, as they know full well how fallacious and how hopelessly untrue such a statement is. The writer knows many who are depending entirely upon fowls for their livelihood, and while not perhaps making a luxurious income, are, at all events, making both ends meet, not always an easy thing to do nowadays.

There is, of course, another side to this picture. While many are making a capital profit from their fowls, there are perhaps many more who are rapidly losing money, and who possibly see nothing before them but the loss of all or the bulk of their savings. It is a well-known fact that we invariably hear of the failures in life sooner than we hear of the successes. Bad news is never slow in spreading, and this is undoubtedly the reason why there seems such a much larger number of failures in poultry keeping than successes. Those who are doubtful of the existence of a poultry keeper who is making his fowls pay, frequently exclaim that until they see the balance sheet of such a man they will remain incredulous. But why should a successful poultry keeper show his balance sheet merely in order to satisfy the curiosity of a disbeliever? I may say that in the course of my work I have examined a large number of balance sheets, many of which showed a handsome return, after deducting expenses for labour and every conceiveable item. The statement, therefore, that poultry keeping does not pay may be, and frequently is, perfectly true; but as a general statement without qualifications it is altogether erroneous and misleading.

I should like, as briefly as I can, to enumerate some of the causes of failure in poultry keeping that I have personally come across, as it may be the means of preventing others from falling into similar "pits." It is often thought that the commonest cause of failure is due to faulty management, and while, of course, it cannot be argued that bad treatment has no effect upon the profit or loss, I do not think the actual management is so often to blame as one thinks. It is unnecessary to add that the general management has a lot to do with the success achieved, and it is well-nigh impossible to devote too much attention or thought to the care and well-being of the stock. It is perhaps in the details of management that a good many go wrong: hatching too early or too late in the season; keeping a wrong variety; feeding on unsuitable foods; or housing in badly constructed or insufficiently ventilated buildings. While these points in themselves would be very unlikely to cause failure, they undoubtedly go a long way towards seriously reducing the profits, and crippling the enterprise.

Save in what may be termed exceptional circumstances, it is unwise to attempt running an establishment devoted solely and wholly to poultry. I know there are scores of such establishments in this country at the present moment, ones that are bringing in their owners a comfortable living, but at the same time I believe I shall have the majority of practical poultrymen with me when I say that, except under special conditions, it is unwise to try to follow along the same lines. Above all, it is foolish—in fact, it is merely courting failure—to commence operations on a large scale; rather it is better to begin in quite a small way, gradually developing as one feels one's feet, and as one learns which branch is best adapted to the locality, which varieties thrive best, and which class of work is the most congenial. Lack of capital, too, is a very common cause of failure. There have been many instances where owing to lack of funds a poultry farm has had to be closed, just at the very moment when success was practically assured, could the place have been kept going another few weeks. It is necessary that anyone who takes up this work shall have enough to live on for at least a year or eighteen months, as it is fatal to success if one has to live upon the place, so to speak, from the very first. No profit can be reasonably expected for a year, or even two years, and thus it means that if there is not sufficient money upon which to live independently of the place, one is really living upon the invested capital.

Some men whom I have known to start poultry farms were doomed to failure from the very first, and the only really interesting feature was the length of time the concern would last, whether it would be for a year, or for two years. Some of them were altogether unsuited to poultry keeping, some did not like the work, but merely went in for it because they had to do something, while some had mental or physical infirmities which handicapped them more perhaps than they realised. Unless one's heart is in the work it is doubly hard to succeed; congenial work is a far more important factor than many imagine. There is a good number of people who take up poultry keeping because they have failed in other walks of life, many of whom have tried half a dozen different things before finally drifting into poultry. Others, on the contrary, have made a success in their particular branch, have saved up a little money, which they invest in a poultry farm, altogether irrespective of the fact that they may be totally unfitted to the work. Others, again, have broken down in health, have been unable to stand the strain of town life, and so have taken a poultry farm. Such men are not likely to succeed; they would not succeed in any other business, and it is surely unjust to blame the industry, when it is really the man himself who is at fault.

It often occurs that the poultry keeper is not to blame for the failure of his enterprise, but rather the location in which he is living, and no matter how skilful or painstaking he or his manager may be, success is practically impossible. Some have attempted rearing and fattening turkeys in a cold, exposed, or in a low-lying, damp situation; others have tried to hatch and rear chickens during the winter in a very unfavourable spot; others, again, have started a fattening establishment miles from a town or from a railway station. In all such cases failure is almost inevitable from the first. The conditions, climatic and otherwise, should always be carefully considered before starting a new place; the nearness to market and the local demands are likewise points of importance, and may make all the difference between success and failure.

There is no doubt whatever that the largest number of failures is due to inexperience, and some of the stories that I could tell, did space permit, regarding this point would scarcely be credited. There are thousands who at this moment firmly believe that all one has to do in order to have a successful poultry farm is to buy a few hens, give them something to eat, and provide them with some sort of a shed in which to sleep, and there will be a continuous supply of new laid eggs and a nice plump chicken for the table as often as required. All that one has to do, therefore, to build up a big business is to increase the number of hens and the like. How hopelessly, pitifully mistaken this is, only those who possess practical experience can fully realise. There is no branch of agriculture in which greater skill and knowledge are necessary than in poultry keeping, and there is certainly no branch in which constant care and ceaseless attention are more imperatively needed. Poultry keeping is without a doubt the most important of all the minor branches of agriculture, and there are enormous possibilities before it. I do not say, I do not even suggest, that a fortune is to be made from poultry; but I do say that when fowls receive proper attention and are looked after in a businesslike manner, they yield a larger profit in comparison with the amount of capital invested than do any other farm stock. Until it is fully realised, however, that poultry keeping is a business, requiring skill and experience, common sense and patience, plenty of hard work and constant attention to detail, the best results will never be achieved.

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Poultry Notes.

Green food of some sort is a necessity to poultry.

Where egg production is the motive success is more readily achieved by the mating of individual birds, which have proved themselves good layers, than by the crossing of two varieties with mere reputation for egg production.

Pound up the bones for the hens; there is nothing they relish more. Place the bones in the oven, or lay them on the hot coals, let them dry thoroughly, and then they can be pounded small with a hammer. Burnt bones are also good. Let them burn till they will crumble when pounded, then break them up lightly, and the fowls will eat them greedily.

Iron in any shape is good for fowls. A little copperas (sulphate of iron) added to the drinking water, or ground fine and mixed with the food, is an excellent tonic, and will often give a healthy appearance to the fowls. An old iron pot makes a good drinking vessel on account of the iron rust it throws off, but it must not be allowed to get stale. Iron filings or iron cinders placed in the drinking water will afford iron to the poultry.

TICK

South Australian poultry owners have found that the very best remedy for the TICK CURSE is

Faulding's

Phenytas.

Periodically dip the infested birds and spray infested houses and runs with Faulding's Phenytas and there will be no further fear of tick.

FAULDING'S PHENYTAS is Absolute DEATH TO THE TICK

Notes for the Month.

An overfed hen is stupid, lazy, and unprofitable. The eager, active, hungry hen is the profit maker.

Every poultryman should be a student. He should by careful study and close observation equip himself to master the emergencies that are certain to arise sooner or later.

Before putting the brooders away thoroughly cleanse them with hot soapsuds and water, stand them in the sun until dry, and give the interior a good application of some liquid lice killer. Never put a brooder away in a filthy condition.

Where the fowls have free range on a farm it is not necessary eo feed them more than once a day. Besides the grain and insects they will pick up, they will get quantities of weed seed, and thus yield a double profit. A flock of fowls at liberty will help to exterminate the weeds on a piece of land by picking up the seed, and the less grain they are given the more seeds they will eat.

Keep a sharp look-out for ailments. It is during such "broken" weather as the present that colds make their appearance, especially among the adult stock and those fowls which have not yet completed their moult. And a neglected cold may lead to something more serious.

When a bird has taken cold, if noticed at once, the attack may probably be shortened by penning the fowl in a sheltered place, and feeding it on warm soft food with a pinch of cayenne pepper in it. Two drops of spirits of camphor every hour for a day will also prove beneficial.

Coughing and sneezing are generally signs of bronchits. Good soft food with a pinch of cayenne pepper in it should be allowed, while as medicine add to each pint of drinking-water 1 fluid drachm of B.P. dilution of nitric acid, a drachm of gum arabic, and a tablespoonful of glycerine. Prompt treatment is the only thing to prevent colds developing into roup.

Now is the time to commence renewing or cleansing the runs. There are comparatively few poultry-keepers who can have fresh ground each year for their chickens. Hence it often happens that at the end of the chicken season the runs, from being unavoidably overcrowded on occasions, become foul.

Foul ground is apt to be the cause of disease breaking out among the flocks. Therefore, give the runs attention on the earliest opportunity. The surplus birds will probably by now have been removed, and the stock is at its lowest numbers. Moreover, it is better to take matters in hand ere the wet season sets in.

The best way of removing poultry taint depends to a great extent on the nature of the place. But whichever course is pursed, it will generally be found wisest to give the ground a rest during the cleansing process.

On a bare earth run the most simple plan is to spade out the "top spit" to the depth of about a foot, and to put fresh earth or road sweepings (dry) on the place to the desired height.

Some people thoroughly sprinkle the runs with lime prior to filling in the place with fresh material. But such a proceeding is necessary only in a small backyard run where the surface has been continually loosened and forked over during the year.

Another good method of cleansing a small yard is to thoroughly scratch over the surface of the ground with a sprinkling of diluted sulphate of ammonia at the rate of an ounce in a gallon of water to each square yard. Use an ordinary water-can fitted witn a rose.

Yet a third way of cleansing a small poultry run is to spade the ground thoroughly and dress it with powdered gas-lime at the rate of about a pound to the square yard. A month afterwards dress the earth during rain with agricultural salt, about two lbs. to the yard.

Where a grass run is being dealt with different treatment is necessary. If the land merely requires freshening the surface should be scratched with a stout iron rake, or gone over with a harrow. Then cover the place an inch or more deep with a compost of decayed manure, ashes, road-side refuse, or even soil. Let it remain unoccupied for a month or so.

Hatching and rearing poultry in the early winter will probably have to be accomplished by artificial means, since broody hens are then somewhat scarce. But it should be undertaken where there is proper accommodation, because, after all, the very early pullets, will pay for their keep in eggs, and there is some little money in the cockerels.

Although attention must be paid to the young stock, the adult birds, should not be neglected, Some are still moulting, and they need careful management. A comfortable house and a dry and well-sheltered run are highly beneficial for their welfare. Any that are "hung in the moult" should have a cod liver oil and quinine capsule twice regularly each day; and some linseed may be mixed in their soft food.

There is no necessity to put stock cocks with hens until a month before eggs are required for incubation. They should, therefore, be kept apart as long as possible. The separation is very beneficial. It will permit of the birds becoming more able to withstand the strain of the breeding-season.

Poultry-keepers should note that the actual breeders should be kept distinct from those birds required solely for laying. Early laying is the chief thing for which to aim when winter

"SARGENFRI" POULTRY YARDS.

BLACK ORPINGTONS.

OUR SPECIAL ENGLISH STRAIN.

Our Special English Strain. Have won dozens of First and Special prizes, also Cups and Trophies in all leading shows.

Pen 1 — A Champion Cock, Son of the famous "Sargenfri King," a great prize winner mated to selected, low set blocky hens of rich green sheen, also prize takers. **Eggs 42/- dozen.**

Pen 2: Headed by "Sargenfri Prince," another splendid cock of "Sargenfri King" line, mated to a few choice hens and pullets of massive size of type. **Eggs 42/- dozeb.**

Pen 3: Headed by a vigorous young Cockerell of great size and broad back, very low set, with good females. **Eggs. 21/- dozen.**

AMERICAN BARRED PLYMOUTH ROCKS.

The Ringlet Strain.

They are barred to the skin: fine feather, fine layers.

Pen 1:—Imported American Strain, headed by a grand shaped, dark cock, mated to a pen of females that won "Garden & Field" Challenge Cup, March Royal, 1911 **Eggs. 42/- dozen.**

Pen 2: Specially mated to produce good layers combined with show qualities. **Eggs. 21/- dozen.**

SARGENFRI WHITE LEGHORNS.

Heavy-Laying strain, have been distributed all over Australia, N.Z., India, Malay States. This strain has been line bred for 12 years, and built up from tested hens laying from 280 to 298 eggs per year. **Eggs. 21/- and 10/6.**

THE INVINCIBLE SARGENFRI RUNNER DUCKS

are veritable egg machines won every 1st and Special Prize in Adelaide Shows during 1911—also won all prizes at March Royal 1912.

Eggs, 21/- and 10/6.

C. J. CHANDLER Near Glynde Hotel, East Payneham.

eggs are required. But, a great layer which has commenced in the late autumn or early in the winter will not be in a fit state to produce robust chickens in the spring.

It is not a bit too early to begin preparationt for housing the poultry during the coming winter. If new buildings are to be erected, commence at once; if the old buildings need repairing, there is no better time than the present to do the work. See that the roof is perfectly tight, and that all cracks are stopped up. If the building is an old one or not sufficiently warm, cover it with roofing paper both roof and side walls—and apply a coat of tar. This will make it absolutely wind and waterproof.

Some poultrymen claim that if a few pieces of rusty iron are placed in the drinking vessel, the fowls will be benefited, especially during the moulting period.

◆

Poultry Diet.

By H. B. Greene, M.R.C.S., Eng., L.R.C.P.I.

"How shall I feed my birds?" is a question which sooner or later confronts everyone interested in the keeping of poultry, whether for profit or pleasure.

It is not enough to know that good health and good diet go together, nor is the answer to the question to be sought in the relative claims of "hard" versus "soft" food, or the times of their administration. In these days of keen competition and small profits, the most minute details bearing on economy (which please distinguish from parsimony) are worthy of all attention; but the fundamental principle which underlies the whole problem of the successful feeding of poultry should never be lost sight of. And that principle is, that, no matter whether the food be the food be hard or soft, no matter whether it be heated or whether it be cold; it is of the utmost importance that the chemical constituents of the daily allowance should be blended in such proportions as to maintain the fowl in health, and to enable it at the same time to fulfil all its profitable functions with the least possible expense to the owner.

The greatest work must be got out of the engine with the most suitable form of fuel, and by the expenditure of the least possible quantity of that fuel. When the details involved in this principle are thoroughly mastered and intelligently applied in the yard, the poultry-keeper will soon find that his birds will be a source of profit, or, at least, that the margin will be greater than it was before.

It is more than eleven years since in a series of articles contributed to this journal, I strongly advocated the feeding of poultry "by ratio" with full regard to the exact chemical combination of the food constituents. At that time, although practised with success and profit in America, where the State poultry experimental stations had been acquiring and giving out among the farmers much useful knowledge in connection with it, the system was scarely known and little followed in this country. How great a change has been effected in this respect during the decade which has elapsed can only be fully appreciated by taking up any recent handbook dealing with the subject of poultry food, or listening to the address of a poultry lecturer to his class on the text of the feeding of fowls! And although in the latter instance, and especially if his audience be a mixed countryside one, the instructor will, if he be wise, refrain from overloading his discourse with technicalities and decimal fractions, he will not worthily fulfil his mission if he neglects to advocate the most economical of all systems of poultry feeding, viz., feeding "by ratio."

The chemical constituents of a perfect dietary must be so combined as to be capable of not only sustaining life and promoting growth, but of supplying sufficient energy to enable the animal to perform any extra work required of it. If, for instance, in the case of fowls, domestication demands a greater return in the way of production, then the dietary must show a proportionate increase in the proper direction, for an addition of the quantity of food alone, without due regard to its nature is seldom the most economical mode of making the desired change.

As those who contemplate the keeping of poultry are often advised that the autumn is a favourable time in which to commence operations, it may not now be inopportune to review this important subject of diet, and its influence on fowls more particularly in reference to their (1) health and diseases; (2) laying properties; (3) table properties; (4) moulting and sitting; (5) general growth, feathering and fancy points.

In traversing with me a path which to some will seem to be only a familiar and well beaten track, I trust that while the novice may be thereby helped and even should it lead only to a close scrutiny of his food bill, he will indeed be fortunate if he finds that his method is incapable of any improvement.

Animal life cannot be supported without a regular and definite supply of nitrogen, oxygen, carbon, and hydrogen, and if it were possible to find a single substance containing those elements in the exact chemical proportion required, the feeding of farmyard stock would be a matter of simplicity. Unfortunately it is otherwise, and we find that although food materials containing two or more of the above-named elements exist in abundance in the field of Nature, no one variety is so composed as to constitute by itself a perfect and all-sufficient food. It is true that milk and eggs, more closely than any other substances, approach the standard of an ideal nutriment, but we see that in the case of the young of mammals the former is incapable of supporting them for more that a very limited portion of early life, while in that of oviparous animals the yolk of the egg will serve for little longer than the embryonic period.

The perfect nourishment, then, is to be sought for in a combination of food-stuffs so blended, that all four elements are present in sufficient abundance as to meet existing demands, and that no one of the four predominates to such a degree as to overtax the digestive and excretory organs in assimilation or excretion. Animals at large, with food material to hand in variety and plenty, have every opportunity, guided by appetite and inclination, to exercise their choice, and unconsciously "balance" their diet, but with those in domestication, and especially in close confinement, it is different. With no opportunity to give expression to the prompting of the natural appetite, they are completely dependent on what is supplied to them. It is obvious that the more skilfully that supply is made to conform to a definite chemical standard in accordance with what is looked for in the way of work or output, the more successful will be the result, while less waste in surplus food will attach to the venture.

The constituents present in all food stuffs may be grouped as follows:—

1. Nitrogenous.
2. Non-nitrogenous (carbonaceous).
3. Mineral salts.
4. Water.

1. Nitrogenous materials comprise albumen and fibrin derived from the flesh and products of animals as well as from insects and worms, albumen being also present in the juices and seeds of all vegetable life; syntonon,

(Continued on page 520).

THE SLICKEST PHOTOGRAPHER of the Kiddies in the State. FRANK A. McNEILL

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Practical Notes on Dry Feeding.

By Prince T. Woods, M.D.

— Dry Grain Rations. —

In dry feeding our birds, we have not made a practice of using dry mashes or ground grain mixtures, chiefly because we found during the first two years of dry feeding that the birds fed exclusively on a mixture of whole and broken grain dry mash did well. Our grain mixtures have been almost exclusively composed of the three staple grains—corn, oats, and wheat, and occasionally barley. Commercial scratch grain mixtures have only been used when obtainable at a reasonably low cost. Corn, wheat, and oats, or barley substituted for oats, feeding whichever is the cheaper, will give all the variety in whole grain that is necessary. Ccacked corn, where it can be obtained sweet, clean, and free from dust, mustiness, or mould, is more acceptable to the birds as a rule than whole corn. In winter time we feed much more than in the summer-time, sometimes feeding as heavily as seventy per cent. corn in extreme cold weather. In warm weather the proportions are reversed, feeding in July and August seldom to exceed thirty per cent. of cracked or whole corn. The balance of the grain mixture is made up of either wheat, barley, or oats; any two in equal parts or all three, according to our convenience. We keep grit, oyster shell, charcoal, and pure water before the birds at all times, and have occasionally mixed shell with the grain food. Beef scrap is kept always by them in a food hopper and is not mixed with the grain, as when coarse scrap is so mixed it encourages them to scatter the grain about and waste it while endeavouring to pick out the meat.

— Cost of Grain Food in Dry Rations. —

Heretofore ground grain mixture fed dry and known as "dry mashes" have been fed in place of a portion of the whole grain, chiefly because the total cost of the ration could so be reduced and a greater proportion of protein food could be used to advantage at less cost.

The prevailing prices for grain delivered at our door at time of writing are as follows: Prices are expressed in dollars and cents per 100lbs. Whole corn, 1.45 dollars; cracked corn and corn meal each, 1.50 dollars; amber wheat, 1.85 dollars; oats, 1.95 dollars; mixed feed and gluten meal each, 1.60 beef scrap or meal, 3.00 dollars. We make a good whole grain mixture of sixty pounds corn and thirty pounds wheat, which stands us about 1.59 dollars per hundred; leaving out ten pounds of wheat and replacing it with oats increases the cost to about 1.60 dollars per hundred.

A good ground grain mash mixture may be made of forty pounds mixed feed (mixed feed is supposed to be fairly equal proportions of wheat, bran, and middlings), ten pounds gluten and ten pounds corn-meal. This mash costs about the same as the whole grain mixture of corn and wheat, or about 1.59 dollars per hundred. Chemically it contains considerably more protein than a whole grain mixture, but just how much of this is well digested and made use by the fowl is not known. The practical results of feeding do not differ, whether the fowls have only the whole grain mixture or both whole grain and the dry ground grain. In either case beef scrap or meat of some sort must be supplied. Add ten pounds of fine ground scrap or beef meal to the mash mixture, and you increase its cost to about 1.79 dollars per hundred pounds.

With fowls that have a tendency to fatten quickly a combination of the dry mash and whole grain would probably be best. If our birds seemed fat and lazy, or showed signs of slacking up in egg production, we should try a ration of combined dry ground grain and mixed whole grains, the latter fed in deep litter. We have used no litter other than sand floors this last winter season.

Wyandottes and Rhode Island Reds do not seem to get over fat on a whole grain hopper-fed ration, even in comparatively close confinement. Plymouth Rocks, particularly the barred variety with their marked tendency to lay on internal fat, would probably require the mixed plan of feeding dry ground grain in hoppers, and whole grains or scratch mixtures fed in the litter to encourage exercise.

Study your birds and feed them well. If you have a good ration and it gives you satisfactory results, do not be in a hurry to change it simply because someone else has a different plan of feeding that brings him good returns. Make sure that the different system is better than yours before you adopt it. A thorough trial of the method with a single pen of selected fowls compared with your other stock on their regular ration is the best way to test out new systems that look good to you.

With grain at above quoted prices, the average general purpose hen consuming 3.5 ounces of grain food daily, would eat about 1.30 dollars worth of grain alone in one year. She would also eat not less than twelve cents of meat food during the same period, allowing that she consume only 0.18 of an ounce per day of dry beef scrap, which leaves only eight cents to pay for green or vegetable food, grit, shell, and charcoal, if she is to be kept at an expense of 1.50 dollars per year. No allowance is made here for cost of care or labour and housing. At a conservative estimate she should yield twelve dozen eggs in the twelve months, which at twenty cents per dozen would bring 2.40 dollars. This leaves a margin of ninety cents per hen, out of which must come the cost of keeping the male birds, housing and hired labour expenses, besides the profit, which pays the proprietor for his time. Manure, and services in hatching and brooding have not been allowed for, and should be figured to the credit of the hen.

From this rough estimate it will be seen that the practical egg farmer of Rhode Island was not far out of the way when he told us that his laying stock averaged to net him a profit of between seventy-five cents and 1.00 dollar per hen per year to pay for his own personal labour and time. Grain

Eggs! Eggs!

Sittings from Heavy Laying

White Leghorns
Black Leghorns
Black Orpingtons
Silver Wyandottes

15 Eggs to each setting. Guaranteed fertile or replaced. 10/6 per setting.

T. E. YELLAND,

S.A. Farmers' Co-Op Union, Ltd

in large quantities, five ton to carload lots, could be bought for a little lower price per hundred than quotations given here. Labour is usually costly, and on sizeable poultry plants reprsents a considerable item of expense. Feeding dry food exclusively means a great saving in labour, approximately a saving of fifty per cent. of the expense of the moist mash method. A veteran Connecticut egg producer told us that he alone could personally care for 2,000 head of layers and breeders, and also raise the necessary quota of chickens for the annual supply of pullets, when all stock was fed according to the dry food hopper plan and housed by his colony system. If he fed daily mashes he would require the services of another man to help do the same work.

— Advantages and Disadvantages of Dry Feeding. —

The advantages of dry feeding are apparent to anyone who has been a slave to the moist mash plan of feeding, particularly where large numbers of fowls are fed. With the dry plan one man can comfortably take care of 1,000 to 1,500 head of laying stock and feel no serious inconvenience; but mixing moist mashes five or six mornings a week for the same number of birds would require a considerable expenditure of time and muscle, besides the added labour of feeding. With the dry method you do not need to replenish the supply of grain food oftener than once a week if you are careful to provide hoppers of sufficient size, and this feeding can be readily accomplished by aid of a wheelbarrow with small flocks or a waggon with large ones. With the moist mash plan you must feed at a regular hour daily. Regularity in meals counts for but little with hopper-fed fowls, since they have the food before them all the time, the chief consideration so far as regularity being that you do not allow the food hopper to remain empty for a longer period than half a day. Usually during this time they will clean up any grain which may have been scattered. With fowls fed on the ground grain dry mash plan regular feedings of scratch grain in the litter are necessary, requiring more labour than where exclusively whole or cracked grain is fed from the hopper, but not as much time and labour as where mashes are fed. There is comparatively little waste with whole and cracked grain hopper-fed birds, while those fed either moist or dry mashes are liable to waste a considerable portion of their food, or else get it badly fouled before it is eaten. So far as actual results in eggs are concerned, hopper-fed fowls can be depended upon to equal those on moist mashes, other conditions being the same, and in many cases the hopper-fed birds will be found to lay best.

Hopper-fed birds are seldom if ever subject to digestive disturbances, while with birds fed heavily on moist mash food precautions must be taken to be affected against diarrhoea troubles. Diarrhoea seldom occurs in a hopper-fed flock. We know of several practical poultry farms where one man and a boy are able to care for 2,000 head of laying and breeding stock, besides raising from 1,000 to 1,500 chickens annually. This would be difficult to accomplish if moist mashes were fed to any considerable extent, except as practised on one plant where moist mashes are fed, and all food for the day is given at one feeding in a covered food trough.

The great saving in labour is the chief recommendation for hopper feeding. Labour saving in these days means money gained, and in many cases means that persons are able to keep fowls who could not otherwise do so. Especially in our country districts it is almost impossible to hire the necessary help even at exorbitant prices. The man who dry feeds and fills up his food hoppers once a week, can keep a few fowls with little labour and inconvenience, since the eggs may be collected and other work done after he returns home at night from his daily business.

There are a few disadvantages of hopper feeding. Where the birds are kept in very close confinement some of the two-year-old and three-year-old fowls will in time become overfat. Where the stock has liberal range, this is a rare occurrence, even in winter time. Such overfat specimens can usually be detected in good season, and the fowl made use of for the table. Do not make the mistake, however, of killing the laying hen. Remember that it takes a fat bird to lay. The thin, tough-muscled specimen seldom proves much of an egg producer.

Hopper-fed birds will sometimes acquire the habit of picking each other about the vent. This usually begins by birds picking at one another to get them out from in front of the food hopper early in the morning, as there are always a few individuals in a flock that will be inclined, where narrow food hoppers are used, to hog the entire front of the hopper in an endeavour to keep the other members of the flock away from it until they have filled up. If such fowls become badly picked about

(Continued on page 522.)

A LETTER TO CLEMENTS TONIC WHICH SPEAKS FOR ITSELF.

BEDRIDDEN YET SHE WAS CURED.

I AM NOW, THANKS TO YOUR TONIC, RESTORED TO PERFECT HEALTH.

Those persons who suffer **from Anæmia or** poor blood, Constipation, Indigestion, **Sickness** after eating, Irregular Heart Action, **Nervousness**, Sick or Neuralgic Headache, **Nervous** Breakdown caused by overstudy **or business** worries, and Kidney **Irregularities, should use** Clements Tonic, because **it acts at once upon** inactive functions and **gives them new force.** It rapidly puts the nervous system in order and makes men and women healthy. The testimonies published week by week in the daily press can be all verified by **any person.** Here is a letter in point.

57 Neil Street, Carlton, Vic.,
17th July, 1911.

CLEMENTS TONIC LTD.,

"I am pleased to let you know that after a long period of delicate health AND FINALLY A COMPLETE NERVE BREAKDOWN, I WAS CURED BY YOUR WONDERFUL MEDICINE. I was a great sufferer for months, always tired, without appetite, frightful headaches, and my nerves in such a state that the least noise upset me. Then the end came, and I thought I was dying. I suddenly collapsed. I was carried to bed, and for two weeks I was not even able to sit up, the least exertion caused my heart to beat dreadfully, and I would faint off again. The doctor's medicine did me no good, and after being nearly three weeks in bed, having read a good deal of Clements Tonic, I decided to try it. After taking one bottle I was able to sit up, AND WHEN I HAD TAKEN FIVE I WAS ABLE TO LEAVE THE ROOM WITH THE CONVICTION THAT CLEMENTS TONIC WAS THE MOST WONDERFUL MEDICINE IN THE WORLD. I am now, thanks to your tonic, restored to perfect health, and still continue to take it, and always recommend it to my friends, though I need not, it speaks to them for itself when they look at me and know what I went through. I have no hesitation in saying I believe I would be unable to write a letter to-day to you or anybody else only for Clements Tonic. May many another sufferer such as I was be cured by your wonderful tonic.

(Signed)

MRS. BLANCHE QUINN."

The facts in the above letter are vouched for because this remarkable recovery reads like a miracle. Yet Clements Tonic is a miraculous medicine for the relief of Nervous Breakdown, Nervousness, Loss of Sleep, Debility and Indigestion. ALL CHEMISTS AND STORES SELL IT. **Get it and get well.**

(Continued from page 517).

or muscle fibrin; casein, present in milk; gelatine, derived from the cartilage and tendons of joints; gluten, a substance identical with fibrin found in corn and grass seeds, and legumen the nitrogenous element of peas, beans, vetches, and potatoes. All these nitrogenous materials are also spoken of under the term "albuminoids." Their chief function as food factors is to build up or repair muscle (by which we mean lean flesh), bones, nerves, and fibrous tissues, portions of which are continually being used up and excreted.

2. Non-nitrogenous (carbonaceous) materials consist of fats and oils, starch and sugar, all of which, especially the starch, are derived, in the case of fowls, from grain, potatoes and pulse, green vegetables and certain of the roots, the fats being also obtained from animal and insect food. The function of the fats and oils is undoubtedly to produce and maintain the heat of the body, and their powers in this respect are two-and-a-half times greater than those of the other carbonaceous materials, starch and sugar. An illustration of the use of fat in this connection is found in the large quantity which enters into the diet of those who live in cold as contrasted with warm countries; hence food containing fat in large percentage can with more safety be given to fowls in cold than in warm weather.

3. Mineral Salts, such as phosphates, potash, lime, common salt and sulphur, occur in small quantities in grain and grass seeds, and are also pecked up by the fowl as earthy particles from the ground. The presence of saline materials is necessary to the composition of the blood, and they held to solidly newly-formed tissues.

4. Water occurs in variable proportion in every form of food material, and forms 74 per cent by weight of the body of a fowl. The principal uses of water in the animal system are to form a convenient vehicle by which food is dissolved and conveyed to every part, to carry away refuse products, and to regulate the temperature of the body by evaporation.

To feed "by ratio" entails the combination of food stuffs in such a way as to ensure that each of the four above-named groups will be represented in standard proportion.

◆

Fattening the Goose.

The general decline of the goose in public favour and the increasing demand for the turkey, may not only be attributed to that capricious thing called "fashion," but to more practical reasons. The goose prepared its own grave, so to speak, in its own grossness. The public demanded a fat article, and they were given one that waxed fatter and fatter as the seasons passed. And an already overfed and adipose people sickened of this carcase of bilious blubber. They cast it from them as an evil thing, and turned their attentions towards the more delicate turkey.

There is, however, no need to despair, and I offer a word here to those who have a flock of geese on the subject of fattening, which is not—be it eternally remembered—the laying on of a super-abundanre of nauseating, oily fat, which helps to weigh, no doubt, but which melts away in the cooking, leaving only a greasy carcase of skin and bone. Of course, a certain proportion of fat is very essential if the flesh of beast or fowl is to be good, but it should be, as far as possible, ingrained in the tissue and muscle, and not stored up in heavy layers in the abdomen nor beneath the skin.

In preparing geese, therefore, running on grass and having two moderate meals a day, the next move on the part of the owner should be to increase the daily rations and see that they are of the right kind.

For a morning meal the following mixtures may be given: (a) boiled potatoes mashed with barley-meal and coarse middlings, (b) ground oats and middlings mixed crumbly, with separated milk or buttermilk, (c) "tail corn" (steamed) mixed with equal parts of middlings and barley-meal, using meat broth or buttermilk for moistening if necessary. Those three mixtures may be supplemented in cold weather by adding a little maize-meal, linseed cake, or butchers' scraps, boiled and minced. During the day, the birds should always have some turnips and mangolds to nibble, and in the afternoon the grain feed may for preference consist of wheat or the best short oats. Barley may be given for a change, and an occasional feed of maize is useful, but the latter must not be used largely, or yellow fat will accumulate, rendering the carcase gross, as I have explained.

I am no great advocate of penning geese during the fattening process, except it be towards the last few weeks. Even then the place should be continually changed to fresh ground. One advantage of penning is that the flock may be kept off the water—too much swimming and drinking being inimical to good fattening. Another is that quietness, which is so essential may be better assured. And, again, it is, of course, possible to feed penned birds in greater security from the visits of cattle, pigs, and the like, to the feeding trough. Care must always be taken, however, in restricting the birds liberty, to see that it is done gradually, or they will fret

KOONOOWARRA POULTRY YARDS.

Barred Plymouth Rocks: Ckl, 1st and Sp. at Victoria P. & K. C. Show; 1st and Medal Essendon Show, Vic. 1st and Sp. Adelaide P. & K. Club Show, 1911; Hens and Pullets, all winners, P. & K. C. Show, Adelaide, 1911: 1st, 2nd, and 3rd Pullet, March Royal Show. Good Utility, £1 1s

Buff Orpingtons: Birds 1st and 2nd Ckl., 1st and 2nd Pullet, March Royal Show. Good sound color and healthy stock; also good winter layers and splendid birds for Export trade. £1 1s. setting.

Rhode Island Reds: America's leading utility birds, lately imported into Australia by me.

White Plymouth Rocks: Snow-white birds, easy to breed and rear, typical Farmer's fowl, good Winter Layers and excellent Table Birds. 1st and 2nd Ckl., 1st and 2nd Pullet, March Royal Show. £1 1s.

White Orpingtons: Imported and prize-winning stock. Won 1st Ckl, 1st Pullet Royal Show, Adelaide, September, 1910. 1st, 2nd, and 3rd Ckl., 1st and 2nd Pullet, March Royal Show. Great Winter Layers and good Table Birds. £1 1s. setting.

Pekin Ducks: Never beaten in show pen. Four Firsts, 1 Second, 2 Sp, at P. & K. Club Show, Adelaide, 1911, out of five entries. Two Firsts, 1 Second and Special at Royal A. & H. Show, Adeleide, Sept. 1910, out of three entries. A limited number of Settings at £2 2s.

I am now booking orders for breeding pens. I mate my breeding pens in June and will supply eggs for setting. Could not supply all orders last season. Book early avoid dissapointment.

Eggs securely packed and delivered on Rail or Coach (buyer pays carriage). Eggs All Stamped Koonoowarra. My Stodk won 23 prizes at Royal Show, March 2921. Terms: Cash with Order. I keep nothing but A1 Stock. I cull heavily and breed only from the Best.

P. C. MANUEL, Enfield, S.A. ◆ **Telephone: Central 273.**

and pine, when fattening becomes hopeless. It is also very desirable to allow them an occasional wander if only as an incentive to appetite, the latter being what the feeder must watch with assiduous attention. Drink must always be given to the birds when they cannot procure it for themselves, and if separated milk or buttermilk can be spared for this purpose nothing will answer better. Both are wholesome (and it does not matter if the former is sour), they help to lay on flesh and to keep the skin white. Equally important is a good supply of grit or earthy matter, such as coarse ashes or broken slag. Overcrowding and dirtiness must be strenuously avoided; cleaniness, comfort, and quietness maintained at any cost.

The secret of producing geese with a really good flavour and free from coarseness is in providing them with as much natural food as they will eat. Geese, as everybody knows, are grazers, and the quality of the land upon which they live has much to do with their flavour and general succulency on the table. And, as far as my experience goes, there is nothing like old pasture and a good supply of home-grown corn and roots for producing goslings of the first quality from a consumer's point of view. A little rough fat, stirred into the food every day or so for a fortnight before killing, improves the flesh and increases weight without promoting grossness, and this is particularly the case in hard, frosty weather.

It is to be hoped for the sake not only of the producer, but the public generally, that the goose will again attain to that popularity and favour of which it could once boast. But it will only be done by a demand from the public in the first instance, for a moderate-sized bird of first-rate quality and flavour, and by the producer who acknowledges that demand and honestly endeavours to supply it in his poultry.

◆

A dust bath is just as necessary for the hen as another sort of bath is to human beings.

WANTED TO SELL.

INCUBATORS AND BROODERS. **Simplex, awarded first price (silver medal) Adelaide Exhibition, 1910. Agent for Cort's Patent Cooler-safe, a boon in summer.** Send for price **list.—D. LANYON**, Manufacturer, 46 **North Terrace, Kent Town.** 6-12.

Muscovys.

(By D. Thompson, N.S.W.)

This is a distinct species. They are not ducks—that has been decidedly proved, as the progeny of these crossed with any variety of ducks are mules, being sterile when mated. Whether they are a species of the goose, or of the swan, we are not prepared to say, as we have never experimented in crossing with either the goose or the swan. From observation and scrutiny of the characteristics of the swan and of the Muscovys, we are inclined to favor the idea that it would be more likely that they would be found a species of swan. They are much like swans in their temperament, in their carriage, and in the hissing sound they make, and also in the number of days for incubating their eggs. However, swan or no swan, they are not a duck, so we simply call them Muscovys. Their generic name is Cairina moschata, and from moschata the corruption Muscovy has been applied to them. Their original habitat is South America; there they are found wild to-day, where they fly about and build their nests in trees. It has been domesticated for some centuries, and has been well known, although never largely bred, in England for many years. The Muscovy is more popular and more largely bred in this State than in any other part of the world. We have found them to be very prolific, hardy, easily bred and reared, easily fed and fattened, and very useful not only in hatching out and mothering their own young, but also young ducklings from English ducks. They make very good mothers, and are very cheap, and require little attention as brooders. They are not considered good layers, the egg-laying competition at Blackwall demonstrating that they could not hold their own with the Indian Runner or Buff Orpington, or even the Pekin; but while at the bottom of the list in regard to numbers, they were easily first in regard to size of egg, one pen laying eggs no less than 40 oz. to the dozen, which is almost double the size of some pullets, so that the 500 odd eggs from D. Settree's Muscovys were equal to about 900 eggs from pullets laying an egg about 21 oz. to the dozen.

They are undoubtedly bad layers. Their greatest use is for setting and mothering ducklings, for market ducks, and for crossing with the English duck for table birds, as the progeny are very hardy, grow fast, and attain an extraordinary weight at three or four months, when they make a splendid carcase, carrying plenty of meat, and of excellent flavor. In using them extensively for sitting, the best plan is to have a long box of about twenty compartments or nests which can be shut off at any time, with a duplicate to take its place for the other layers, take away the eggs as they are laid, substituting a few dummies in each nest, and when you have a dozen or so broody, put in your eggs, and about the fifth day test them out. Give about thirteen eggs originally, and when testing out allow about eleven to remain in each nest.

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"Koonoowarra."

Mr. P. C. Manual alters his advertisement in this issue and places on record his extensive winnings at the March Show. Mr. Manual has not been, at the game long but he has already made a name and reputation for himself and his birds which older fanciers have cause to envy. In reply to our question as to last season's hatchings and results Mr. Manual writes. I had a very satisfactory breeding season and the result of the various matings were beyond my expectations. Thanks to Mr. Hart of Victoria who specially selected my birds and whose advice I followed I have 40 Plymouth Rock pullets and about 20 Cockerels, as even in barring and type as anyone could wish for. In White Rocks, through being a little late in hatching I have not a great number but they make up in quality I think. White Orpingtons are practically sold out. These are really an ideal fowl for all comers and very hardly, quiet good winter layers, good table birds I believe before many years they will be the leading breed in Australia, as they are rapidly becoming in England and America. I have a nice lot of Buffs of very good color and type. Rhode Islands Reds—I am very pleased to say the four hens and two Cockerels I imported are still living and we have hatched, and have about 40 chicks from them. They appear a very hardy fowl and have taken to this climate like a fish to water. They are good foragers and very quiet natured, and if as good in egg laying as represented, they will take on as a utility fowl. Pekin Ducks—I am sorry to say I can't supply orders in these now Evidently people know a good thing when they see it for I have had a good number of inquires for stock this last few weeks, but as a rule if anyone wishes to secure any of these they must look ahead. I have been offered very good prices to let some of my breeding stock go but I have had to absolutely refuse eo part with more.

It is pleasant to read the report of so much success and to know that Mr. Manuel's opinion of his birds was amply justified by results at the March Show.

(Continued from page 519.)

the vent so that they bleed, the habit of picking is liable to become general. Fortunately, this trouble is of rare occurrence, and can be checked by promptly removing the first bird that shows any blood on the fluff or about the vent. The trouble may occur in any flock, whether fed moist or dry. Using wide, easy-access hoppers will remove the cause, and so prevent this bad habit of picking.

Where birds are hopper-fed, and the owner neglects filling up the hoppers so that they go quite a long time without food, care must be taken to prevent the hungry birds cramming themselves too full of grain, and so acquiring indigestion. This need not occur if the hoppers are never allowed to remain empty for more than six hours of daylight.

In hopper feeding care should be taken to use only clean, sweet, wholesome grain that is free from dusty grain, particularly if the grain is musty, or the dust contains mould, as this will cause trouble. If the precaution is taken to feed only wholesome food there need be no trouble from this source.

Hoppers must be frequently cleaned and free from any accumulation of dust and dirt. It is a good plan to wash them out occasionally with a mild solution of creolin, five tablespoonfuls of pure crelio to one gallon of water. After cleaning allow the hopper to thoroughly dry out in the sun, even if you are obliged to give a few feeds of whole grain scattered on the floor while the hoppers are drying. Covered food boxes or hoppers are best, since they prevent the contained grain from becoming soiled with droppings and dust. It is not necessary to buy elaborate and patent equipment in order to dry feed birds satisfactorily. Some of the best self-feeders or hoppers that we have seen have been home-made from waste lumber or box material.

Hopper feeding possesses one other great advantage in that it undoubtedly the most cleanly method of feeding fowls. Particularly is this true where exclusively whole or cracked dry grain mixtures are used. The food in a protected or covered hopper is kept practically free from droppings and dust. On the other hand, where mash mixtures are fed the moist mash must be fed in a trough or on a board where the fowls trample in it while eating, mixing in droppings and other filth which adhere tenaciously to the moist grain, and are so taken into the fowl's crop, making a very favourable opportunity for the spread of disease and infection with intestinal parasites. Even dry grain fed in litter is a rather filthy manner of feeding the birds. If the litter could be kept always perfectly fresh and bright, exercise feeding of this sort might be considered an ideal plan, but unfortunately after litter material has been on the floor of the pen for a single day it becomes horribly fouled with excrement and other filth. It soon becomes musty and mouldy, and the dust raised in the litter, which must in a large measure be inhaled by the fowls, contains large quantities of dry pulverised droppings, mould spores, and other filth. Any fowl eating out of the litter must take into its crop a considerable quantity of dirt and filth, and, as is well known, they do at times eat harmful quantities of the dirty broken straw.

Moist mash advocates are prone to tell us of the terrible dangers that we will encounter in dry food hopper feeding. So far as we personally are concerned, we have not yet met such disasters face to face, and have not to date found any common sense reason for even desiring to return to the moist mash plan of feeding. The moist mash feeders tell us that by keeping grain always before the fowls in hoppers we encourage laziness, tend toward overfat, lessen vitality and put a premium on decreased production. We have not found these claims to be true, and as moist - mash - food - scratch - grain methods of feeding are generally practised to-day, we fail to see where these so-called "good old reliable" methods have an advantage over the hopper feeding plan. The general rule with mash feeders is to give a fairly full feeding of mash once a day five to seven days a week. This is usually a full feed, as much as the fowls will clean up in from fifteen to twenty minutes, although many feeders allow any excess of mash to remain on the feeding boards until it is cleaned up. As soon as a fowl is filled up with mash it exhibits little or no desire to exercise, frequently returning to the roost or to some quiet corner to sleep off its gorge. We fail to see where this has any advantage over permitting the fowl to fill itself up at a food hopper if so inclined. Except in the early morning during the cold

21 Poultry Papers for 1s.

THE AUSTRALIAN HEN AND FANCIERS' FRIEND is the generally acknowledged best Poultry & Fanciers' Paper in the Commonwealth. It is published twice a month and costs 5s. a year, post free. But to prove its value, we shall send you 12 back numbers—a liberal poultry education—post free, for 1s. Money back if you are not satisfied. Write to-day before they have all gone.

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AND FANCIERS' FRIEND,
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BRITTEN'S REGISTERED DENTISTRY.
ARTIFICIAL TEETH ON EASY WEEKLY PAYMENTS.
Painless Extractions One Shilling. Gold Fillings. Crown and Bridge work. Only Address—
20, CURRIE STREET (Opposite Savings Bank).
Open Saturday Evenings 7 to 9 p.m. Daily, 9 to 5.30. Saturday, 9 to 1.

"ONTARIO" WHITE LEGHORNS.
have twice won Roseworthy Egg-laying Competition.
World's Record for placing the first five pens in Blenheim Competition 1906-7, 100 pens competing.
I am offering eggs from Roseworthy winners at a very low figure to the first 20 applicants. This pen beat all Australasian Competitions held in open yards for 1908-9.
High class stock and eggs in season satisfaction guaranteed.
Telegrams—"Ontario."
T. B. BROOKS - - Clarendon.

weather and shortest days of the year, it is a comparatively rare occurrence to find hopper-fed birds hanging around the food hopper. When the nights are long and the days short they are usually quite hungry and anxious to fill up the first thing in the morning. For the greater part of the year fowls that are accustomed to hopper feeding, and that have not been starved by allowing the food container to remain empty too long, will usually take a few mouthfuls of grain at the hopper, and then hustle around in and out of the house before taking another bite.

Our birds run out of doors whenever they please, summer and winter, the small fowl door in the front of the pen never being closed. In open weather they range to the extreme limits of their pens, and if given free range would cover a very large territory. When we feed birds on mashes and regular grain feedings they invariably were found hanging about the feeding place for a considerable length of time before the meal hour.

As the scratch grain plan of of feeding when combined with the moist mash method is generally practised, grain is kept in the litter practically all of the time, so that the birds can always find food by scratching for it. With deeplitter a considerable proportion of food is always wasted in this manner. Even where somewhat scanty regular feedings of scratch grain scattered in the litter are given, there is practically always a quantity of whole or cracked dry grain lying before the fowls on the dirty floors of the pens, or mixed with filthy litter. Wherein does his plan of feeding possess any advantage over the more cleanly hopper feeding method? With either plan, the actual amount of dry grain food consumed per bird per day is practically the same.

Another point to be considered in regard to hopper feeding is that the natural,, normal methods for fowls in feeding is practically a continous performance from daylight until roosting time. The healthy bird, if given an opportunity to live in the normal, natural manner, is almost continuously feeding throughout the day, a little at a time and often. When she is not eating she is ranging about either for exercise or in search of tit-bits, taking pleasure in scratching in some forbidden spot, dusting herself, or is in the nest box fulfilling her duty to her owner. This is just what the hopper-fed bird can be depended upon to do.

Hopper feeding may be a lazy man's method of caring for fowls, but the burden of the proof of this assertion falls on the shoulders of the moist mash advocate. Some people always seem to enjoy doing their work the hardest possible way. Our aim has always been to get the best obtainable results with the least expenditure of time, labour, and money, and by the shortest possible route.—(Reliable Poultry Journal, America.)

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Scratchings.

A laying hen should have her food and fresh water always at hand.

It is essential that confined fowls be supplied with plenty of sharp gravel.

A spoonful of oil of turpentine is a good remedy for tape-worm in poultry.

A nest-egg will usually stop a hen scratching the nest. If not, use shavings.

A hen can be fed on almost anything that a cow will eat, and many things besides.

Keep the hens with a reasonably sharp appetite, and they will lay more eggs, which will hatch better and produce stronger chickens.

Active hens are the best layers.

Clean houses and runs are better than medicine, because they render physic unnecessary.

Introduce new blood among the poultry once a year. To do this, get a good rooster and mate him with the best hens.

A. R. CRESWICK,
DENTIST
(Late with Eskell & Tattersall).
VICTORIA SQUARE W., ADELAIDE.
(Near Post Office).
ALL WORK GUARANTEED.

Artificial Teeth made and misfitting Teeth remodelled. Teeth Scaled, stopped and Extracted. Laughing Gas administered. Painless Extraction.

Consultation and Advice Free.

Country districts visited regularly. See dailies for dates.

T. W. INGHAM,
Manufacturer of Plaster and Cement Ornaments, Fibrous Ceilings, Cornices and Arches a Specialty.

His Workmanship in the principal Villas around Adelaide and in the Country Townships, has given him a reputation for the most up-to-date Artistic Work or Fibrous Ceilings.

They are non-conductors of heat, cold, sound, dust, and fireproof, and give deep relief and under-cut, therefore stand out well with straight and sharp harresses. 50 designs to select from. Estimates Given.

WORKSHOP AND SHOWROOMS—
VICTORIA PLACE, at Back of Govt. Offices, Adelaide.

Anything that will make milk will make eggs, and milk is a first-class poultry food.

Sunflower seed improves the gloss of the plumage of poultry. It is fattening food.

Give lime for growth of bone and for eggshell material. Oyster shells broken small are good.

If fowls leave part of their breakfast in the dish, remove it. Feed what they will eat, and no more.

A little cayenne pepper in the food often stimulates laying in winter.

E. ANDERS & SONS,
AGRICULTURAL ENGINEERS, &c., FREELING, S.A.
Manufacturers of High Quality STEEL CULTIVATOR SHARES.
Perfecsly Shaped to do good work, cut out all weeds, are light in draught, and give entire satisfaction in wear.

Anders' SHARES are absolutely the best and Cheapest you can Buy.

These shares are made from special quality steel, carefully tempered, and will stand the severest tests. We make all sizes of Shares to fit all makes of Imported Spring Tooth Cultivators and Harrows and for Colonial made Cultivators, either Stump Jump or plain land. With large square hole for loop fixture, or ordinary bolt hole. We can supply loops when required. Our Reversible Shares are Money Savers.

FARMERS! It will pay you to use our Shares--Post your orders to us.
E. ANDERS & SONS, FREELING.

Egg-Eating.

Most farmers have had some experience of that tiresome individual, the egg-eater. It is nearly always a hen—cocks very rarely get into the way of eating eggs until they have been taught to do it by the hens. I have known a case, however, in which a cock will deliberately stand outside a nest until an egg is laid, and then when she has taken her departure he will step in and devour it at once. Egg-eating generally starts as the result of an accident. Some hens which are over-productive have a habit of dropping eggs from the perch at night, and naturally they break on the floor, and then in the morning they are seen and devoured, and so the practice of egg-eating is started. It may, however, be started in a variety of ways, as when two or three hens are fighting for the same nest, or when a hen is sitting on a nest and she breaks one or two eggs and brings them off with her. Anyway, there is no doubt at all that the ingenuity of modern inventions has produced a very simple means of discovering egg-eaters. The modern recording nest (to which reference has been made in this journal several times) is not only useful as a means of recording how many eggs hens lay, and which hens do lay them, but it is also a very good contrivance for determining which hens are egg-eaters. In the up-to-date recording nest a hen enters one of the divisions and cannot get out again until she is let out; apart from that, no other hen can get in until the previous occupant has been let out—by reason of the automatic arrangement, which resets itself when the lid is opened to allow one bird to come out, then allowing another to go in, but not before. It will, therefore, be seen that the way to discover egg-eaters is to get a general idea that one of a certain number of hens is doing something of the kind, and get them all penned up, then watch and see which hens lay, and, having discovered that, see them on the nest, and it is quite clear that you will very soon know which hen goes on to lay, and when she comes off has left no egg behind her. Having thus marked down the suspected culprit, an examination of the nest will generally reveal some traces of albumen left behind, for however completely an egg-eater clears up her feast, there is almost certain to be a little moisture in the centre of the nest where the egg was, which is of a sticky nature, clearly indicative of albumen; or there may be, and frequently is, of course, some yolk left on her beak. Anyway, here is another use for the patent record trap nest, which will not only record layers, but will also record egg-eaters, and as this type of nest costs very little from the various manufacturers who make and advertise them, the farmer who is up-to-date and wishes to be up-to-date in all his poultry methods, and desires to make his poultry pay without suffering any loss such as a few egg-eaters amongst his hens will soon cause him to suffer, will do well to invest in one or two recording nests, being sure that they will very soon save him their cost and a great deal more.—Exchange.

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A Good Layer.

A good layer cannot be infallibly detected by its appearance, but a first-class layer is never a drowsy, lazy-looking bird. Generally speaking, a good layer is bright looking and active in her movements, is early on the forage in the morning and late in going to roost at night. Her eye is usually bold and bright, and her comb very firm and blood red. Such a bird will seldom turn out to be a poor layer. On the other hand, I have had some extraordinary layers which have had very little in their outward appearance to distinguish them from birds of ordinary laying capacity. There would be no need for trap nests and similar contrivances if the best layers could be judged by sight, but it is a safe rule to discard the very dull looking birds and keep the bright, active ones, for out of the ranks of the latter will the best layers be picked.

CROWN & ANCHOR HOTEL,

GRENFELL STREET (adjoining East End Market).

A. MIERS, Proprietor.

(late of Old Queen's Arms, Wright Street).

wishes to intimate that he is now in possession of the above hotel, and hopes to merit a share of public support. Ample stabling. Ostler in attendance day and night. Terms moderate. A trial solicited.

A DRY SADDLE WHEN IT RAINS IF YOU WEAR

TOWER'S
TRADE MARK
FISH BRAND
POMMEL SLICKER
The long service and the comfort it gives makes it the
Slicker of Quality
Sold Everywhere
A. J. TOWER CO.
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"Sargenfri."

Mr. C. J. Chandler places his advertisement as usual in this issue from which readers will gather that the Sargenfri Poultry Yards are fully maintaining their old time reputation. Mr. Chandler is, he tells us, more than ever a convert to the belief that the White Leghorn is without a rival as a money maker. This opinion is emphasized by the fact that of the hatchings last season, 1,000 were Whites, 250 Plymouth Rocks, 100, Black Orpingtons, and 100 Runner Ducks. Mr. Chandler believes in early hatching, consequently he has very large numbers of fully matured pullets for sale. Even in Leghorns he makes a practice of getting his chickens out, from June onwards closing down in September. In Rocks Mr. Chandler reports a very excellent lot of young stock, which will please buyers. The Sargenfri Runners need no recommendation, they are known throughout the Commonwealth, and beyond. This week Mr. Chandler has sent another pen of these birds to India, with pens of Rocks and Leghorns to follow. In speaking of the laying qualities of these latter Mr. Chandler quoted the following letter:

The fifteen (15) pullets I purchased from you last year have been a revelation to me in regard to the egg laying capacity of White Leghorns. They have laid right through winter and summer and look as though they are going to keep it up for another year.

I wish I had kept a strict record of all the eggs I got from them, but I think I would be correct in saying they averaged from 8 to 10 eggs a day all the year around. They are absolutely the best fowls I ever owned. P.S.—(15) pullets averaged 10 eggs a day total one year 3650 eggs. Eggs average 1d. each reveune £15 4/2, cost of food £3 15/- net profit £11 9/2 average profit per bird 15/3, eggs laid per bird 243.—

◆

Give the moulting hens a few handfuls of hemp seed now and then; it will help to loosen the old feathers.

Pigeon Notes.

March Show.

(By "Carrier.")

Pigeon Section, open to all pigeons hatched since July 1, 1911. In the face of what has been said to the contrary, I must report the above fixture as a very promising venture, being well ahead of predecessors, with some very excellent youngsters to be met with. A pleasing feature of the section is the standard wire pens supplied by the society. An improvement for another year would be, demanding that all birds be rung or authentically stamped. From remarks I heard whilst walking down Pigeon Lane, I can only conclude that some visitors at the show did not quite know what a youngster really is—or can it be possible that the want of knowledge is on the part of a few exhibitors. I don't mean to say that either of the birds shown were in the Ark, but I would not advise anyone, minus the digestive abilities of the ostrich, to take on pigeon broth, made of some of the birds penned.

Now to the birds—

Carriers.—Cock (2), hen (2); would like to see some better, also cock class judged the other way. However, this is the best young class of carriers seen in the State for many years.

Pouters.—Again the best young classes for many years; second cock a handy pigeon later on, a bit young at present.

Barbs.—Four or five exhibits here look promising; have seen a few far worse in show pen, and many far better.

Dragoons.—Blue barred cock (2); the winner about the best youngster in head points ever seen here, still hardly typical in body and feathering; color fair; wins easily. Hens—Nothing to waste ink over. A.O.C. cock—A fair class, well up to our usual standard, but the birds in this State are not robust enough. Above applies to first and second, the third bird in this class being a long way behind. A.O.C. hens (4)—Winner best hen shown; others—well, I can save more ink here.

Tumblers.—Almond cock or hen—Just a fair one, with what might have been a beautiful beak, but it went wrong. A.O.C. cock (3)—Winner rather nice type for youngster, but very coarse in beak; second bird of little or no carriage, with wry beak. A.O.C. hen (3)—Winner gets home from a fair type of Tumbler with a twisted beak. No place for her sort in show pen.

Jacobins.—Cock (2), hen (2)—All four birds much of a sort, only poor specimens of the breed.

Saddlebacks.—Cocks (2)—Winner about the best youngster yet shown in South Australia; second a fair Yellow, wrong color. Hens (1)—Again a Yellow.

Helmets (2).—Reds, color weak, skull wrong. Looked rather like last seasons, a bit out of shape.

African Owls.—Cocks (2)—Winner will make fair bird; second not far behind. Hens (3).

Turbit hen (1).

Turbiteens.—Cock (2) — Winner well ahead, rather like the style of foot feathering on second bird. Hens (2)—Things more even between these two.

Blondinettes.—Cock (1), hen (1)—Both fair pigeons.

Fantails.—A very mixed lot of Fans on tap; can't see a likely adult winner in the whole crowd. Winning white hen the best show bird of the lot today; the second cock, a white, with about one-eighth more tail than he has would be a fine bird.

Nuns (3).—Winner fair; other two could be shown better.

Antwerps.—The first and second winner in both classes look to have a dash of this breed in them, but are all wrong in body type; the rest of the exhibits should have been in Working Homer Class.

Show Homers.—A mixed-up lot here; still a few Show Homers amongst them, but far too young.

Boys' Class.—Some pigeons here that our coming fanciers should be very proud of.

The following is the prize list in the pigeon section :—

Judge, Mr. T. Koerner; steward, Mr. H. R. Hammer. Carrier, any color, cock, H. H. F. Miller (1 and 2). Pouter, any color, cock, E. Hefron; W. F. Hall. Hen, E. Hefron; W. F. Hall; C. W. Creer. Barb, any color, cock, H. H. F. Miller (1 and 2). Hen, H. H. F. Miller (1 and 2). Dragon, blue, cock, Mrs. H. L. Chase; C. W. Creer. Hen, C. W. Creer; Mrs. H. L. Chase. Dragon, any other color, cock, C. W. Creer (1 and 2). Hen, C. W. Creer (1 and 2); M. Hamley. Tumbler, almond, cock or hen, H. R. Gelston. Tumbler, any other color, cock, W. B. Viney; J. Leslie. Hen. H. R. Gelston; W. B. Viney (2 and 3). Jacobin, any color, cock, F. E. Jarvis (1 and 2). Jacobin, F. E. Jarvis (1 and 2). Saddleback, cock, J. Walters; J. Leslie. Hen, J. Leslie. Helmet, cock or hen, Miller and Martin. Owl (foreign), any color, cock, Miller and Martin (1 and 2). Hen, Miller and Martin (1 and 2); H. R. Gelston. Turbit, hen, H. R. Gelston. Turbiteen, any color, cock, D. Cruickshanks (1 and 2). Hen, D. Cruickshanks (1 and 2). Blondinettes, any color, cock, Mrs. H. L. Chase. Hen, Mrs. H. L. Chase. Fantail, white, cock, E. S. Lewis; L. H. Brougham;

(Continued on page 528).

O.K. LOFTS.

Have some real beauties to sell in TURBITS, BLONDINETTES, AFRICAN OWLS, NUNS and S. F. TUMBLERS.

These lofts have won CHAMPIONS at Sydney Royal, also CUPS, and MEDALS at S.A. Canary and Pigeon Show and a host of SPECIAL, FIRST and SECOND PRIZES.

Prices from 5/- each.

Apply—
E. A. GROSSER,
Hamilton, S.A.

PROPERTIES!

INVESTMENT & RESIDENCES of every description in City and Suburbs.

FARM & GARDEN properties, &c.

Apply—
MAELOR-JONES & Co.
Land Brokers,
Bowman Buildings,
KING WILLIAM St., ADELAIDE

Home Notes.

The Children.

Ripe fruit in moderation agrees with most children, but if it causes diarrhœa it should be stewed.

Giving children milk that is slightly turned often causes diarrhœa. A good way to test it is to buy some blue litmus paper from a chemist, and if there is any doubt about the freshness of the milk dip a little bit in. If the milk is turning the paper will change to a red colour, and is not fit for the children.

Very little meat is needed, and white fish or eggs should be given in its place. Milk puddings are good, but porridge is better omitted from the daily menu.

It is very important that a child should be carefully instructed in the little niceties of life—that it should be taught politeness, consideration for the feelings of others, self-control, and everything that goes to make up that greatly desired requisite—charming manners. Nor is it enough that it should be so taught by precept. Example is indispensable. Parents cannot be too careful as to how they conduct themselves in the presence of their children. Children, as a rule, are nothing if not imitative. Children should early be permitted to take their meals with their parents. If, when the family are alone, politeness and thoughtfulness to one another are shown, the force of habit will ensure their good behaviour in company.

During hot weather children need less food and of less stimulating quality than in winter. Rashes in the skin and general feverishness are frequent results of over-feeding in warm weather.

Children are easily affected by the mood of their elders. Where an atmosphere of love and brightness makes them yielding and tractable, an atmosphere of gloom or coldness shuts up and repels natures keenly susceptible, as most children's natures are.

It is much easier to chill the confidence of a child than it is to regain it after it has turned away from you. To begin with, a threat or a command is not the best way to win the trust of a child—or a grown person either. And any course is unwise which serves to remind the child of his state of dependence upon your mood or whim. He acts then to please you because he is afraid of you, not because he loves you and trusts in your good-will toward him, and a confidence so forced must react badly on both parties.

Children are also very sensitive to ridicule, and are wonderfully quick to detect it. A tiny child will shrink from the sneer or the sarcasm which you thought veiled in the tone of your voice. He will catch your side glance and mocking smile, and it will take you many a long day to regain the trust you lost by using them.

But the child's trust in and reliance upon those in whom he believes are so touching and spontaneous, so complete and far beyond our deserts, since it often seems as if we could not pay him enough for the delight he brings to our life, that one wonders that so little care is taken to gain his beautiful faith in our wisdom, and so much carelessness shown in the keeping of it.

The books a child reads have quite as strong an influence in moulding his character as his companions can have. If it is worth while to train our children at all, it is worth while not only to watch the books they read, but to study what books to give them to read. They will read something; and as soon as a child begins to beg for stories so soon should we begin to select. A good plan is to enter in a book the name and author of any especially good and interesting books you come across. It is surprising how rapidly the list will grow; yet if we neglect to note their names in some such way it is surprising how few of the books we can recall when we want to make use of them. As to telling stories, mothers might do much more of it than most do, with profit to themselves as well as the children, if the stories are selected with care. It is an excellent plan to "take turns" with the children, and require them to tell the stories occasionally.

— About Water. —

Bad, impure water will bring rashes and pimples and many little ills, and it is a cause which so often lies unsuspected.

Hard water is bad for washing purposes.

Should the water be hard, it may with advantage be softened by the addition of a small quantity of liquid ammonia or powdered borax. It is a good plan to put a large tablespoonful of borax into the water jug every time it is refilled, so as to insure having softened water for toilet use.

Rain water is excellent for toilet purposes. It should not, however, be collected or stored in leaden cisterns, as it absorbs that metal.

Aerated waters should not be taken in excess, as they have a lowering effect on the system. Unsweetened aerated waters are the best.

Medicated aerated waters should not be taken without a doctor's advice.

£2 **WE ARE BUILDING ON** £2

Securing a big share of your Business this year.

For the sum of £2 Cash we will deliver to the Adelaide Railway Station the following goods carefully packed. If you want them put on board boat at Port Adelaide, add 1/- extra.

Bag best White Sugar, 1A, 66 lbs., at one penny per lb.	0	5	6
1 tin Morton's Kippered Herrings, 2d. 1 lb. Candles, 3d.	0	0	5
2 tins Fresh Herrings, 4d. 3 lbs. Japan Rice, 3d.	0	0	7
3 large bars No. 1 Angel's Soap	0	1	0
3 tins Fruits in Syrup, 9d. 3 tins Jam, assorted, 9d.	0	1	6
1 packet Kooloo Tea, 8 ounces for 3d. 3 tins Potted Meats, 2d. ...	0	0	5
1 box Note Paper and Envelopes, 3d. 1 lb Extract of Soap, 1d. ...	0	0	4
1 lb. tin The Celebrated "Crown" Baking Powder	0	0	3
20-lb. tin, gross weight, Our 2/- Tea, reduced to buyers of this parcel for ...	1	10	0
	£2	**0**	**0**

A £1 parcel may be arranged by taking half quantities of the larger items, others will be added to make up the amount. Customers desiring may have goods of equal value **not mentioned in this list** substituted in place of any of the smaller lines not wished for. When goods are intended for prepaid rail sidings or ports, it will prevent delay if cost of carriage or freight is added.

Special Lines—Wines, Choice Vintages, a dozen varieties to choose from, 1/3 bottle; Ale and Stout, 8/- doz.; Aerated Waters, 5/-; Tonic Ales and Hop Beer, 5/6 doz.; English Ale, qrts., 13/0; Guinness Stout quarts, 13/9, Brandy, 23/ gallon; Dry Gin, 20/; Whisky, 22/; Rum, 20/-; Old Tom Gin, 20/- Assorted Jam, 4 doz. case, 24/-. Assorted Fruits, 3-doz. case, 24/-.

Seasonable Fresh Fruits and Vegetables supplied.

HENDERSON BROS., 236 and 288 Rundle Street, Adelaide,

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Home Hints.

Spoons used in giving medicine should be scrupulously washed each time they are used, although but one invalid may use them. No housewife would think of allowing any member of her family to eat with a fork or a spoon that had not been washed since the previous meal. It is far worse to invite the entrance of disease germs in a debilitated system by using a dirty spoon to administer medicine.

How to make Linseed-Meal Poultices.—The great thing in making linseed-meal poultices is to have everything very hot. Scald both basin and spoon, therefore, and warm the linen on which you spread the poultice. Put two tablespoons of linseed-meal into the basin, with half the quantity of mustard, and then mix them smoothly together while you pour in boiling water. When of consistency of thick gruel, spread the mixture upon linen or brown paper and pour quickly over it a teaspoonful of salad oil to prevent the poultice sticking.

Onions are almost the best nervine known. No medicine is so useful in cases of nervous prostration, and there is nothing that will so quickly relieve and tone a worn-out system. Onions are useful in all cases of coughs, colds, and influenza, in consumption, sleeplessness, scurvy, gravel, and kindred liver complaints. Eaten every other day they soon have a clearing, whitening effect on the complexion.

In washing up greasy things a spoonful of ammonia added to the water will be found a great help in removing the grease effectually. Borax, powdered, should also be kept handy to the sink. It is a good plan to add a little to the water in which kitchen towels are washed, as it not only tends to keep the towels sweet and wholesome, but also to keep the hands soft. In fact, borax may be added with safety to the water for any domestic operations, as it is absolutely non-injurious, and keeps the hands from geting red and rough-looking.

Salt and water applied to basket and straw work and rubbed in with a soft nail brush is a most effective cleanser.

When the neck and throat have become brown or yellow-looking they may be whitened by the persistent application every night of the following paste, spread on a soft rag and rapped around the neck: Honey, 1 oz.; lemon juice, one teaspoonful; oil of bitter almonds, six drops; the whites of two eggs. Add enough fine oatmeal to make a smooth paste.

A raw mellow apple is digested in an hour and a half, while boiled cabbage requires five hours. The most healthful dessert that can be placed upon the table is baked apples. If taken freely at breakfast with a coarse bread, and without meat of any kind, they have an admirable effect upon the general system, often removing constipation, correcting acidities, and cooling off febrile conditions more effectively than the most approved medicines.

To restore lace that has become quite yellow, and yet should not be as white as it must surely become by washing, make suds in a glass jar, drop the lace in, and stand the jar in the sun.

Hot vinegar rubbed on the spots with a cloth is an exceedingly easy way to remove paint from windows. The vinegar must be very hot, or it will not move the spots.

A change of scenery, fresh faces, or a good blow of fresh air, is worth all the tonics in the world to a woman whose face is beginning to look old, or who is nervous and tired, and gives a prettier glow to the cheeks than the finest rouge in existence.

Obesity goes a long way to making a lady look older than she really is, and it is the encouragement of indolent habits which allows obesity to gain the ascendancy over elasticity. A person whose mind and body are ever on the alert will seldom have recourse to diet or science to decrease her size and weight, and at the same time she will keep her youthful appearance. Facial massage has within recent years greatly come to the fore, and is in most cases a splendid thing for enabling a person to keep a youthful appearance. Wrinkling up the brows is one of the worst things a person can indulge in who is anxious to appear youthful. But even in some cases facial massage fails: and if a thin, white face seems unwilling to become plump and round in response to massage, build up your system by taking plenty of milk, eat well-cooked cereals, take a raw egg in milk once or twice a day. Hot milk is also very good, and so are baked apples, and ripe, sweet fruit; and by taking either or all of the above, with a little patience they will do wonders for you, and you will be surprised, at the end of a month or so, at the youthful appearance of your face, and also at the beautiful, clear complexion which you have.

A business woman, whose experience has been long and successful, said to me the other day: "If I were asked to give the best advice I could think of for young women who are earning their own living, or who have the cares and expenses of a household to look after, and if I had to confine myself to just four words, I should say, 'Start a bank account.' It is an easy matter to do so nowadays, when both the savings banks and others offer women every possible convenience and inducement; besides, it is a good thing to do, for several reasons. It fosters a feeling of independence and develops business-like habits, two essentials for a successful business woman. Then, too, it is a convenient and desirable thing to pay bills by means of cheques where it is possible to do so. It preserves a record of the transaction, and frequently prevents annoyances and mistakes. To my way of thinking, a bank account, even though it be a small one, should be looked upon as a necessity rather than a luxury by every woman who has business affairs of any consequence whatever."

A friend of Robert Hall, the famous English preacher, once asked him regarding a lady of their acquaintance: "Will she make a good wife for me?" "Well," replied Mr. Hall, "I can hardly say. I never lived with her!" Here Mr. Hall touched the real test of happiness in maried life. It is one thing to see ladies on "dress" occasions, and when every effort is being made to please them; it is quite another thing to see them amid the varied and often conflicting circumstances of household life.

UNLEY PARK PRESERVED FRUITS & JAMS

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Made from locally grown fruit of best selected quality.

Every tin guaranteed. Pure and unadulterated.

Storekeepers supplied direct from the FACTORY, UNLEY PARK, or from R. F. DEANS, distributing Agent, Waymouth Street, Adelaide.

IT WILL PAY FRUIT GROWERS TO TRY UNLEY PARK WHEN SELLING.

(Continued from page 525).

H. D. Gray. Hen, E. S. Lewis; H. D. Gray; L. and H. Brougham. Fantail, any other color, cock, L. and H. Brougham; H. D. Gray (2 and 2). Hen, H. D. Gray (1 and 3); L. and H. Brougham. Magpie, any color, cock, D. Cruickshanks. Hen, D. Cruickshanks. Nun, any color, cock or hen, Mrs. H. L. Chase; H. R. Gelston (2 and 3). Antwerp cock, McMillan and Fox (1 and 2); Mrs. H. L. Chase. Hen, McMillan and Fox (1 and 2); Mrs. H. L. Chase. Show Homer, cock, F. Goodwin. Hen, F. Goodwin. Working Homer, cock, McMillan and Fox (1 and 3); Mrs. H. L. Chase. Hen, C. W. Creer; Mrs. H. L. Chase. Any other distinct variety, cock, Miller and Martin. Hen, Miller and Martin; C. W. Creer.

Boys' Classes.—Any variety, cock, W. Porter; G. and D. Cruickshanks; Tom Morris. Any variety, hen, G. and D. Cruickshanks; W. Porter; Jack Morris.

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Victorian Notes.

(By G.J.M.)

Fanciers in general will be interested to hear that Mr. Gus. Shee, the enterprising Victorian Saddle-back fancier, has determined to try the experiment of sending a team of Saddlebacks to England to compete in the shows. As developed in Victoria, the Saddle has departed from the English standard, as regards marking, and also in type of head. The English variety of the Saddle has jewmarks; it has not the stripe clear of the eye as is the case of our Australian birds, and it does not show the decided "shirt-front" that our birds do. These points are the glory of the breed as we know it here, and I have always felt convinced that English fanciers would be struck with the beauty of our production. I congratulate Mr. Shee on his enterprise, and sincerely hope that the venture will be a success.

Most of our breeders have now separated all their pairs, and are anxiously scanning each youngster as it moults out to see if the always expected "champion" has made its appearance. I have it on good authority that breeders of Dragons have done well over this side, and in my last notes I spoke about the boom in Fantails.

Homers are experiencing a veritable boom, and the importers of rings say that they have sold more for Homers this year than they ever remember doing before. We are looking forward for a record of this variety in the show pen when the winter months come round.

The Carrier is not to be found in Victoria. In fact, I only know of two birds of this variety around Melbourne, and we have not seen one in the shows for many years.

◆

Pigeon Notes.

With Show Season approaching the writer would like to see fanciers arrange for plenty of interstate competition. South Australia Canary and Pigeon Society are putting on a Ladies Class in the various sections of the forth coming Show abd I believe they found one man with pluck enough to judge. In confidence he told me that he has purchased a Will form.

Fantails on the boom.—Would like to see fanciers of this charming variety in the various States conjointly produce a Trophy for Interstate competition say to be shown for alteratively in the various States contributing to cost of same. Now you Fanciers why not get a move on and get things going this year.

Any correspondence addressed to this office on the above subject will be put into proper hands.

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Elder's Trustee and Executor Company, Limited.

Less than two years ago Messrs. Elder, Smith & Co., decided to inaugurate a new department under their control—that of Elder's Trustee and Executor Company, Limited, of which Mr. A. S. Chapman was appointed Secretary. We regret to have to record the death of Mr. Chapman, which occurred on Tuesday, February 27, at Kent Town, after a short illness, brought on by an attack of typhoid fever. The deceased gentleman, who was highly respected both in business and private life, began his career as an office boy with the well-known firm of Messrs. Elder, Smith and Co. during October, 1856, and when he died he had raised himself to the position of co-manager. Mr. A. E. Fryar, who has held an important position for about five or six years in the land department of Elder, Smith and Co., has been appointed as Acting Secretary. It was predicted by commercial men generally at the time of commencing this new branch that it would have a very bright and successful future, there being ample scope for such an undertaking. The amount of business that has and is now passing through this new business has exceeded all expectations. Under the late Mr. Chapman's able and courteous secretaryship the trustee business had increased by leaps and bounds, proving beyond all doubt that the foresight and action of the directors of Messrs. Elder, Smith & Co. in affording the general public the opportunity of their being able to entrust all trusteeship and administration of estates to a highly recommended and permanent company, had been thoroughly appreciated. There is a growing feeling in favour of entrusting all trustee transactions to a genuine and absolutely reliable company, in preference to relegating such responsibilities to individual trustees, and so avoiding the untold trouble caused by the carelessness or lack of knowledge on the part of individual trustees. Individuals may die, as they often do, and endless complications and expenses ensue. Without, however, a permanent institution, such as the one above referred to, no complication can possibly arise, whilst, with a trained staff available, estates can be administered much more economically and satisfactorily than can be accomplished by private individuals, no matter how good the intentions of the latter may be. The company undertakes to act as executor, trustee, administrator, attorney, guardian, or in any other fidiciary capacity, also manages estates and collects rents or dividends. The authorised (£50,000) and subscribed (£100,000) capital of the new company is ample for all requirements, while the Directorate includes the names of gentlemen holding the highest positions in commercial and pastoral circles in the State, viz., Messrs. T. E. Barr-Smith, T. L. Browne, G. H. Prosser, A. J. Murray, and Peter Waite.

Rubberised Leather Belting.

outlasts all other kinds and is not affected by water or heat.

RUBBERISED LEATHER for Harness, boots, etc., is second to none. Read what Mr. Chris. Venning, of " Pearlah," Port Lincoln, says.:

" The RUBBERISED LEATHER Harness that I purchased three years ago has been pretty well in constant use, and is none the worse for wear now. Belt Laces, bought same time, I used for two seasons for lacing Harvester belts and now I am using same laces on a Chaffcutter Belt; toughest I ever used. Braces bought the same time are as good as new, and will last me a lifetime. Boot laces and Soles carry same reputation, and now the boots, just received, highly satisfactory. I shall have much pleasure in recommending RUBBERISED LEATHER to all my friends."

From all storekeepers. For further particulars,

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For Present Sowing, and at all times.
The Best Procurable.

We Supply Everything for the Garden, Farm, Greenhouse and Lawn. Agents for "Electro" Brand Arsenate of Lead, 25 per cent. better than the best now on the market, International Stock Food Company's Preparations, Paynter's Calf Food, Hearson's Champion Incubators, Spratt's Dog Cakes, Bird, Poultry and Dog Medicines.

E. B. COX & CO., Seedsmen &c. Rundle St. East
ADELAIDE.

Notes for the Month of May.

THE OPEN GARDEN.

Finish up pruning evergreen shrubs, trees, and climbers. Get on what manure is required, and distribute over the beds, then dig and prepare ready for any plants which have to be put in, or for the reception of seeds—that is, such things which require to be sown where intended to flower, or, in other words, those that do not readily transplant.

Cut off the tops of Dahlias, and take up the roots and stow away in a dry place for their winter's rest; likewise Gladioli which have done flowering, and whose foliage is commencing to turn yellow.

Plant Anemones, Ranunculus, Hyacinths, Tulips, Gladioli, Narcissus, Iris, Ixias, Amaryllis, Sparaxis, Liliums, Babiana, Triteleia, Helianthus, Snowflakes, Snowdrops, Lily of the Valley, Crocus, Freesias, and many other bulbous and tuberous roots, and if the ground is naturally stiff mix some sand or wood-ashes with the soil where the bulb or tuber is inserted.

It is now too late for planting lawns of Buffalo or Couch, but a good substitute for the winter is Perennial Rye Grass. This, too, can be kept during summer where sufficient water can be used, and is much softer than the former named grasses.

Plant out all evergreen shrubs and trees, climbers and deciduous shrubs and trees towards the end of month.

Once the ground is soaked with rain Roses, too, may be transplanted.

Take up layers of Picotees, Pinks, and Carnations, pot into 4-in. pots, and keep in a close frame for a week or two, when they may be taken out, hardened off, and transplanted. Preference should, however, be given to tree or perpetual-flowering Carnations. I have repeatedly of late referred to the beauty and superiority of this class over all others for general purposes, and, indeed, too much can scarcely be said in their favor, inasmuch as they embrace nearly all colors, are easily grown, flowers large, highly perfumed, and almost continuous flowering, while the other classes are more delicate, have but one short season of flowering, and comparatively scentless.

All flower seeds enumerated in last month's issue may still be sown.

Those already sown and strong enough to handle may be pricked off into pots, pans, or boxes, in which way they will make better plants, and can be lifted with a little soil attached to their roots when required to be transferred to their flowering quarters.

See that all Chrysanthemums are secured to stakes, or they may at any moment be beaten down with heavy rains, and their beauty destroyed for the season.

The moment the ground is well soaked with rain edgings should be taken up and replanted—that is, such as Pyrethum (or Golden Feather), Thyme, Marjoram, Pinks, Thrift, Violets, and other perennial plants.

Cuttings, too, may be put in of Fairy Rose. This makes a capital edging for drives or large borders, and when once planted will last for many years with no other attention beyond clipping once or twice a year. It is a profuse and continuous bloomer.

Now is the best time to sow Sturt Pea.

THE GREENHOUSE.

Pelargoniums, of all classes, if outside may be brought into the greenhouse, it now being their growing season. Give them plenty of room, air, and light, and pot up as may be required—that is, as soon as their roots have fairly reached the sides of pots Just a shift into one size larger each time is sufficient. Pinch where necessary to produce a bushy growth, and the moment aphide puts in an appearance fumigate with tobacco, choosing a still night for the job.

The Zonale Pelargoniums will come into bloom at once, and keep up a display the winter through.

Chinese Primulas may be brought in from the frame or shadehouse to bloom shortly.

Push on Cinerarias by potting up as may be required, and sow more seed.

Plant Hyacinths in, say, five-inch pots. Keep in dark place until well started, and water sparingly at first.

Bring in all tender plants from the shadehouse, such as Coleus, Alternantheras, or anything else of a tropical nature.

Last season's plants of Fuchsia which have been cut back may be repotted and brought into the house, and pushed on for flowering in early spring.

Chrysanthemums (pot-grown) must now be placerd under glass, when their flowering is much prolonged.

Gloxinias, Achimenes, Gesnera, Caladiums, and such like now going to rest may be placed under the stages, and kept nearly dry for the winter.

Fuchsia cuttings strike readily now.

Mealy bug is a troublesome pest in glass structures, and the best remedy is to mix some fir-tree oil with rather warm water, and dip while in a warm state any plants which are affected. The same solution will kill all other insect life also.

Many of the miscellaneous greenhouse plants will undergo a season of

(Continued on page 532).

A. G. TOYNE

Practical Saddle, Harness and Collar Maker and Repairer . . .

wishes to notify the public that he has removed from 20 Franklin Street to

Corner Pulteney and Flinders Streets

and respectfully solicits the continuance of your patronage. All kinds of New and Second-hand SADDLERY. Harness and Stable Requisites stocked.

All Orders promptly attended to. Repairs a Speciality. Old Harness taken as part payment for New, and full value allowed. All work guaranteed and the most reasonable prices charged. Price-list free on application. Buy direct from the Maker.

Tree Talks.

The first consideration in tree planting should be a suitable soil. If in a nursery the ground should be well manured and ploughed or spaded from twelve to fifteen inches deep, and well pulverised. If the trees to be planted are for street planting they should be planted from six to eight feet apart each way, so that they can be easily cultivated and worked amongst. This allows of a free circulation of air and gives a chance to form a fine head, and their roots and fibres are always more abundant than when they are planted too crowded; it also makes a more vigorous tree for future use. In planting, the tree holes should be dug broad and deep enough to admit of all the roots without crowding. The centre of the hole should be somewhat elevated to set the tree on. The tree should then be carefully looked over, to see that there are no bruised roots or limbs; if there are any they should be cut smooth with a sharp knife. If the tree has good fibrous roots, little if any of the top should be removed, unless it is a straggling limb that is spoiling the form of the tree; but if the roots are poor and top good, it is well to head in each branch to one or two good eyes or buds, but not to make a mop handle of it by sawing off the top, as is often done. The tree should then be set in the centre of the hole, the roots carefully spread out, and the finest of the earth carefully worked in amongst the fine roots. This is easily done in most cases by having one take hold of the tree near the surface and shake it slightly while the earth is being spread over the roots. The earth should be well firmed with the feet if the tree is small, or, if the tree is large, with a rammer such as they use to ram pavements with. The lighter the soil the more necessary the firm planting. but in heavy clay soils there is not so much need—only to firm the tree.

— Street and Roadside Planting. —

In planting shade trees along the streets, much more care is required in the preparation of the soil to make it successful. In the first place, in making your streets, all or nearly all the good loam should be removed, and its place filled with gravel or small stones, which afford but little nourishment to the growing tree where its roots are confined to that alone. It is true a tree will exist for a long time in a comparatively poor soil, but it will repay the planter in a few years to see that his ground is well prepared in the beginning.

The holes for street trees should be excavated two or three feet deep and eight to ten feet in diamter, the good soil, if any, put on one side, and the gravel, clay, or stone removed, and the hole filled with good loam. If taken from an old pasture the coarse sods should be put in the bottom and the finer soil on the top. If a portion of well decomposed manure is mixed with the soil, it will much improve it, as it must be remembered that the trees planted on the streets do not, as a rule, get the annual top dressing that those do that are planted in gardens, neither can the roots for a number of years reach the neighbouring gardens, although they will in time, which will show in their increased vigour. On country roadsides, where the road is little more than a few loads of gravel dumped on top of an ordinary soil that has been rounded up to shed the water, it is probably not necessary to make a deep excavation for the tree, as it would be in a city or its environs. But even along these surface roads it pays in the end to prepare and plant a tree well. The soil should be allowed to settle a few days or longer, when the tree may be planted in the same way as recommended for the nursery planting. The tree when transplanted should not be much deeper than it stood in the nursery. Two or three inches deeper will not make much material difference, but, at the same time, it is best not to have much of the stem below the ground.

— Removing Large Trees. —

Trees of a very great size can be removed successfully if time and money are of no account, but it is an expensive process and should be attempted only where immediate effect is wanted, or in the case of a rare variety that requires to be removed and cannot be replaced otherwise. To prepare a large tree for removal a deep trench should be dug around the tree from five to seven feet from the base of the tree, and working under so as to cut off all the roots possible without disturbing the hole. The ends of the roots should all be cut

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enormous stock of
Shrubs, Climbers, Palms,
Greenhouse and Verandah Plants.
Roses, Fruit Trees, Vines,
Hedge Plants, etc.,
are sure to please.

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WALKERVILLE.

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Established 1851.

smooth, and the trench filled up with a good compost of peat, rotten sods and manure, and left for a year, when a second trench can be opened at the outside of the first one, and the tree carefully undermined with a pick, so as to remove the soil with as little injury to the young fibres as possible, and the tree carefully drawn over, so as to cut whatever tap root that may have been left. If a supply of bass mats is at hand they can be carefully bound around the ball of earth, and, if it is not too large, it can be loaded on a drag and drawn to the place of planting, where the hole has been prepared beforehand. If too large for a drag the ball of earth may be surrounded by boards with layers of hay and straw firmly bound with cords, a few boards passing underneath, and the whole fastened to the stem, which should be well wrapped with hay or woollen material before any force for lifting is applied. It can then be raised with the use of a derrick on to a truck and taken to the desired place, lowered in the hole, the binding taken off, the roots carefully spread, and the soil well worked in amongst them, and well firmed.

Large trees can also be transplanted by digging around them in winter and allowing the earth around them to be frozen solid, having the ground prepared previously and covered with coarse material to keep out the frost, and removing them on a sled to their destination.

—Jackson Dawson in "Horticulture."

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Table Centre Pieces of Growing Plants.

A well-dressed centrepiece is a decided addition to the ornamentation of a dining-room and the absence of it makes a table look bare and unfurnished.

With the pans ordinarily supplied for this purpose it is difficult to fill them so that the plants will thrive for any length of time. They are too shallow to allow the use of sufficient soil to keep the plants going.

A person purchasing one of these centrepieces gives first attention to the ornamentation of the pan, and if this passes muster regardless of its depth, or rather, lack of depth, the question of what to put in it, is discussed. Something very dainty of course to harmonise with these or those furnishings in the room, but while these plants must be delicate to a superlative degree, they must also be as tough as boarding-house steak. No consideration is given to the fact that the temperature is now high, and again low and chilling. This should have no bearing on the case, as any collection of plants should be stimulated to luxuriant growth when placed in one of the many artistic metal creations used for centre pieces!

About two weeks in a house works a decided change in the appearance of the plants, and a couple of weeks further stay makes it look as unattractive as a chicken with the "pip." Then comes the reckoning. The pan is sent back to the florist with an impersonal note, bristling with sarcasm, in which the capability of the florist is questioned in no pleasant terms. Such things are calculated to cut deep.

It would be well to explain that to keep a centrepiece looking fresh and attractive, it must be renewed about every week, and to do this, two or three pans should be filled, and when not on duty, should be kept in the greenhouse, convalescing. This may seem like an expensive proposition, but it is the only practical way to get results that will keep a smile on the purchaser's face.

The deeper pans solve the problem but the great objection to them is their height. They dress better than the lower ones, and the plants actually grow in them, once and awhile.

Water kills more of these decorative contrivances than anything else. An occasional watering is by far better than a regular soaking, as it keeps the plants hustling for the little water they get, and they forget to die in a hurry.

A few hours in the light, not in the direct sun will be a help toward keeping them going.

—Horticulture.

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Cannas.

To grow Cannas the roots must be taken up at the close of every season, say July or June, and the ground thoroughly manured and dug deeply. In about a month afterwards cut off pieces of the mass of roots, taking care that each one has at least two eyes, and plant them about 9 in. deep and 2 ft. apart. They begin to flower early in the season, and continue to flower for seven or eight months, reaching their greatest perfection during January and February. Besides well mulching them with stable manure, sprinkle a couple of handfuls of superphosphates round the roots of each plant three times during the flowering season. To get the full benefit and beauty of the flowers they should be picked for the table before breakfast every morning, because the orchid varieties (which are the finest), are burnt up by the sun before noon if it is at all hot, but in cloudy weather they last all day. A fresh lot of blooms are open every morning.

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Watering Lawns.

The constant cutting and watering of lawns tends to exhaust the plants of which it is composed. To renovate the lawn, and put fresh vigor into the grass plants, short manure should be spread over it from one to two inches thick and well brushed in with a yard broom, and then well watered, or, if chemical manures are preferred, a good mixture would be 3 lb. superphosphate and 1 lb. of kainit to 1 or 2 lb. sulphate of ammonia to every forty square yards.

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Continued from page 529).

rest during winter, and in consequence must not be over-watered.

Sow Petunia, Cineraria, Cyclamen, Calceolaria, Mimulus, and Tropœolum in baskets.

Plant Lilium auratum, L. speciosum, L. speciosum album, L. eximium longifolium, L. Thunbergianum, and L. tigrium in pots. Keep the bulb well down in the pot, and fill in with rich soil as the roots reach the surface.

PITS AND FRAMES.

Cuttings of both hard-wooded and soft-wooded plants may now be put in, and every available inch of room occupied with seed-sowing and pricking of seedlings, either singly or several in a pot, for after-planting in the open beds.

Sow Polyanthus, Musk, Auricula, Primula obconia, Cyclamen, Lobelia cardinalis, L. fulgens, Pelargonium, Carnation, Verbena, &c.

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Annuals: Their Cultivation and the Best to Grow.

The definition of an annual is known to most everyone, but I might define it in a few words thus—a plant which is raised from seed, flowers, reproduces seed, and then dies in one season; that is termed an annual. Annuals are to be found throughout the world, but the finest have been brought from California, Mexico, South Africa, and Eastern Asia.

One of the first things to be done is to procure fresh and well-ripened seed, and of the best quality only, as without these two essentials you cannot succeed. Now comes the sowing part, and the mode of doing this varies according to circumstances. Sometimes it is sown where the plants are to flower; and as annuals are short-lived they should be shifted as little as possible, except when very young, or as I shall explain later on.

In sowing seeds in the open ground there is always a risk of failure, owing to their being overlooked and allowed to get dry; also when they have germinated are attacked by slugs and other insects. Again, one has not always ground prepared to sow seeds at the right time, therefore the sowing should be done in boxes or pans, and the most convenient way is to get a galvanized iron case five to ten feet long, and raise it a foot or more from the ground, then fill with very light sandy loam, level the surface, give a good watering; afterwards partition off the spaces and sow the seed.

When the seeds are fit to handle, a very good plan to adopt in the best class of annuals is to prick them out three or four inches apart into other shallow cases containing soil somewhat heavier than that used for seeds, and when the ground is ready they can be planted with a ball of earth to each plant. In this way the plants are not checked, excepting when they are first pricked off. After planting water the ground well, even if it be raining heavily (for I have known people put in plants during rainy weather without watering, and perhaps when they have come round the next afternoon the plants are almost dead). Continue to water during dry weather and keep the weeds down by constantly moving the surface of the soil. In the case of the taller kinds, they should have a neat stick put down to protect them from breaking. As the bloom withers it should be picked off, which adds to the appearance, and also prolongs the blooming period.

There are several ways of planting annuals, but the most effective is massing—that is, planting a large bed or lot of any one variety together. This can only be done in large gardens where there are plenty of beds on lawns and about the garden. The general system is to plant in clumps of six or more plants in a mixed border, and if successions are kept up, your garden may be full of bloom for about nine months in the year. When planting phlox and stocks, in either clumps or masses, they should be at least six to eight inches apart, and in the case of stocks, this will allow of thinning out the single flowers.

I believe in the system of thoroughly working the ground for plants in general—and so much more is it necessary for short-lived plants, such as annuals; they should be placed in the most favorable conditions for them to grow and bloom. So if we are to expect some return, we must not only work the ground well, but put into it something for the plants to feed upon; therefore, instead of digging a lot of manure in the ground at the beginning of winter, mulch heavily at the end of it, with the best manure only (not half sawdust) This will not only sustain the plants, but act as a preventative to the sun getting at the ground and drawing out the moisture. It may be found one mulching is not enough; then give another, as the extra cost is more than compensated by the use of less water. By stirring the ground frequently the mulch gets worked up into soil, so advise not too fine a material, and a most suitable one would be one part well-rotted cow manure, three parts half-decayed horse-manure, two parts well-rotted horse-

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manure and bedding, and two parts sharp river sand, all well mixed. The cow manure could be used alone, and dug in at the digging season. Growers need not confine themselves to these sorts, as they are not always convenient to get.

Acrocliniums (everlastings).—It is best to sow these where they are to flower or in pans for greenhouse decoration; require good loam.

Brachycome.—A very pretty annual in masses; ordinary soil.

Calliopsis.—This is a first-class annual, flowering two or three months together; very effective in large clumps or on lawns; good loamy to sandy soil.

Campanula macrostyla and rosea.—Tall-growing plants, but showy; loamy soil.

Candytuft.—Another good plant. The white should be planted three and four in a clump, and for the other kinds one to two plants is enough. They are very brittle, and should be tied up as they grow. A nice soil inclined to be stiff is best, but any garden soil will grow them.

Centaurea moschata (Sweet Sultan).—These plants are not grown so plentifully as they should be. Fine for cut flowers, especially the white and yellow.

Chrysanthemum (annual).—Fine for large borders, clumping together in various colors; will grow in almost any soil, but prefers rich loam.

Eschscholtzia.—A very hardy annual (biennial here); grows in any soil.

Gaillardia.—Splendid for cutting; very hardy; not particular to soil.

Godetia.—Some of these are very showy in large clumps, but they are inclined to spread aobut too much; ordinary soil.

Helichrysum (everlastings).—Classed as annuals, but biennials here. They are very good for large borders, the flowers being very useful for winter bouquets in a dry state. Good, stiff loam wanted, and will take a deal of water.

Linum.—Pretty in masses on banks and borders; does not last long.

Lupins.—These are very hardy, and can be grown in any soil. They make a fine display in the open borders, also good for cutting purposes. Sandy soil suits them best.

Marigold (African).—In light sandy soil this plant may be had in flower during the spring months, but the summer is most suited to its flowering.

Marigold (French).—It is more hardy than the African variety. Fine for massing or in clumps in a sunny situation. Sandy soil in spring, and heavier loam for summer flowering.

Myosotis (Forget-me-Not).—Although most of these are perennials, our hot seasons kill some of them. Useful for edgings, clumps, pot-work, and are fine for cut flower work in button-holes and light displays. Good garden soil.

Nasturtium.—If sown early, these can be had in flower during the whole winter. The dwarf kinds are showy in masses, and the trailers can be used to cover fences, mounds, and rock-work. As they are mostly bright colors, good use can be made of them in dinner-table decorations and other ways at a time when flowers are scarce. Not particular to soil.

Poppy.—A class of annuals that are very showy in the mixed borders in late spring. They are very striking, although they do not last long in flower. Almost any soil.

Phacelia.—This is one of the finest blue annuals that are grown; a great improvement on the Whitlavias. Does not like too much wet; a sandy soil is best.

Phlox Drummondii grandiflora.—Phlox and stocks may be considered the cream of annuals For massing in beds or on lawns, or in clumps about the borders, Phlox have no equal, continuing in bloom for months; and for making a display of the brightest colours, I may say without fear of contradiction they are the cheapest annual any gardener or amateur can invest in They will flower in poor soil, but they delight in rich, sandy loam, with plenty of cow-manure, in the winter and early spring; heavier soil will suit them in the summer. Mulch well, and use plenty of water.

Rhodanthe (everlastings).—A plant that I should like to see grown more than it is; very suitable for pots or pans in grenhouse work, also in clumps on the borders. Very sandy soil required, and not kept too wet.

Salpiglossis.—This makes a first-class annual, and not grown enough; good for borders or massing in beds, especially in late spring or early summer. The colors of some of the flowers are very beautiful; soil rich and of a gravelly nature, with good drainage.

Senecio.—A late spring flowering annual, resembling a double cineraria in bloom. The tall kinds are used in large borders as a background, but the dwarfs are to be preferred, as they are so compact, and flower for some two months or more; rich loam, rather light, for early flowers.

Stock.—Considered to be the favorite annual, on account of it being so long associated with garden flowers, its hardiness, free-blooming, and sweet smelling qualities. There are different ways of growing it, such as edgings, clumps, and massing, which is the best if there is sufficient room. A good bed of stocks on a lawn makes a fine picture, and the perfume from them is not to be surpassed. Commencing to sow seeds in March, a succession can be kept up till August, which will give plenty of flowers to the middle of December. They succeed in a rich, firm loam, and like plenty of well-rotted cow manure. I might say if early flowers are wanted limestone or sandy soil suits best.

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Palms and Ferns.

Altogether, palms and ferns are favorite house plants, and there are very few housekeepers who do not take some amount of pride in keeping in as good a condition as possible such floral decorations. Preference may be given to palms. Although more costly than ferns, if carefully nurtured, they are well worth the extra expense, for as regards appearance there is no house plant to beat a strong, healthy growing palm. The following hints on the care and treatment of this plant may prove serviceable.

In the first place, it might be mentioned that palms are often greatly injured by being kept constantly in darkened halls and in apartments that preclude the treatment essential to their health. They should be placed in a strong light, but not, however, in a hot sun. It must be remembered that, although limited and early morning sunshine brightens and invigorates the palm, strong sunshine destroys the rich green color. A daily sponging of the foliage with tepid water should be given, and if the palms are carried to another apartment for an hour of morning sunshine and thoroughly showered once or twice a week, they will remain in a healthy condition with judicious watering as demanded.

When the palms are first received they should be potted with the soil and roots intact. Provide a pot of larger size and as deep as possible; roots of nearly all palms run downwards instead of spreading, so that if the pot is twice as deep as wide it is none too much. The palms should have good drainage, as they will not remain healthy in soggy soil. Place three or four inches of charcoal or broken pottery in the bottom of the pot, and over this a layer of florists' moss or some other fibrous material, so that the soil is prevented from washing into the drainage; over this a generous layer of soil; place the palm on it and fill around with soil, water thoroughly, and keep it in a light, cool place but out of the sun. Keep it in this place for a week or more.

When the palms are once established do not water them until the surface of the soil looks dry and shrinks slightly from the sides of the pot; then give sufficient tepid water to thoroughly saturate the soil and to run through into the saucer, but do not allow any of the surplus water to remain. It might here be mentioned that surface watering, or a slight and frequent dribbling, is ruinous to all plants, and especially to the mass of palms.

Shower them at least once a week —better every other day—if you want them to shine as if varnished. If it is not convenient to shower them so often, the stems and both upper and under sides of foliage might be sponged three times a week with tepid water. Daily sponging is even better, a soft fine sponge being used, as it is least liable of all things to catch and tear the foliage. If treated in this way the palms will always be found to be free from pests.

No plant is more free from pests than the palm, but it may happen that they will sometimes appear. If small white worms appear in the soil give a thorough soaking with lime-water; if one application does not answer give another.

Plants should not be re-potted oftener than once in two years. Once or twice a year a portion of the old soil should be removed from the top without disturbing the roots, and should be replaced with fresh, rich soil. A good fertiliser could be given once a month. An occasional soaking with weak soot tea, when the soil is dry, will intensify the color and gloss of the foliage.

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Beautifying the Home.

The power of plants in absorbing all decaying animal and vegetable matter, which would otherwise infect the atmosphere, need not be dwelt upon. Frost and sunshine both assist to the same end, but without abundant plant growth they would be powerless to render the atmosphere fit to breathe. Every blade of grass that grows by the doorway, even the sprays of the humble weeds that spring up in otherwise barren places, where even grass will not grow, and all verdure in its degree, serve the purpose of purifying the air and converting the unwholesome things which may be a menace to life into health and beauty.

It is only a short time since plants have been generally cultivated for their flowers. A few gorgeous plants have been grown in the vicinity of palaces and royal dwelling places from unknown times, but the democracy of flowers which levels palace and cottage is of modern date. The poor man had no briar rose clambering over his cottage, unless it grew there spontaneously, and when it did there was no precedent for him to preserve it. The gardeners of the past centuries devoted themselves to practical gardening, raising only vegetables and fruits which were in demand for food. A great many of the herbs formerly cultivated have grown so apace that they are "idle weeds," that grow in spots which would without them be bare and brown—fit cul-

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ture beds for foul germs. Where the vegetation is lush and the sunshine is bright there is no danger of impure germs lurking in the air. A screen of fragrant flowers is not only delightful to the senses, but in the power its roots possess of absorbing the impurities in dish-water and iaundry suds thrown around them they are of hygienic value. Thrown over the leaves the laundry suds would soon kill all growth. Thrown around the roots of sweet peas, morning glories, and other plants, so that the leaves are not touched, the impurities and the soap-suds this water contains both act as stimulants to the growth. No strong fertiliser like the soap-suds of the laundry should be thrown over grass or on any plant so that it touches the verdure

The German and French peasants possess in a pre-eminent degree the ability to use everything that will assist in fertilising the soil, and in making every desert place in the vicinity of their cottages "blossom like the rose." They manage to raise vegetables on plots of the very smallest size it would be possible for them to cultivate. The American householder is used to abundant garden space in the country, and does not think of training peach and pear trees against walls and so utilise all the space that it is possible to utilise. The abundance of the trees, vines, and plants cultivated in the vicinity of cottages in Europe not only brings its reward in fruit and vegetable food, but actually makes the air more wholesome to breathe and protects the cottage from the otherwise scorching rays of the sun. Cultivate blooming vines and flowers of all kinds around the kitchen door, because they are wholesome as well as beautiful. A neat housekeeper can be recognised more certainly by the neat appearance of the back door than by an ornate front door with shining knobs and escutcheons.

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Water in the Garden and Home Park.

No one will deny that one may possess a garden beautiful without lakes, waterfalls, and pools and fountains, but the generality of mankind have a preference for those which have some one of these pleasant adjuncts, as they add to the interests and the enjoyments of a country residence. In hilly and mountainous country there is usually the opportunity of making use of running water for supplying a pond with abundance, or making cascades, and by making devious stretches of comparatively still water on the level by means of suitable excavations. The water may take the form of a stream of varying breadth, furnished with gentle projections jutting out into the stream, and easy outline which when planted with trees, shrubs, and flowering, as well as ornamenatl leaved plants, afford the gardener facilities for adding interest and beauty to the banks. Such still or slowly moving streams afford admirable sites for patches of water lilies and other aquatic plants.

Before the site of a lake is fixed upon the nature of the soil ought to be ascertained, for if it allows water to percolate too freely, the bottom and sides would have to be made watertight by a six-inch layer of tenacious clay, well worked and beaten to a smooth surface, and carried rather higher than the proposed level of the water. Where no such operation is needed the banks under water and for 6 to 8 inches above it may be simply cased with stone or coarse gravel, so that the soil be not undermined by the action of the water. The outline of a lake will depend in some measure on the contour of the land, but is more pleasing to the eye if it be of a serpentine character with projections at long intervals on which trees and shrubs may be planted to add still more to its intricacy, and supply surprise views, and stations for rockwork, or for choice conifers, or flowering trees and weeping willows.

The depth of a lake in a warm climate should not be less than 6 to 8 feet in the deeper part, or more than 2 feet near the banks if it is intended to plant aquatics, excepting such as are quite hardy, deeper water than this being too cold in the summer months for healthy development; [illegible] their plants when they are placed far distant from the banks. If a lake be less than 6 feet and the inflow meagre there is the risk of fermentation taking place in the warm months, especially after the lapse of years, during which masses of leaves have been blown into it, and settled at the bottom.

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Paths should be kept clean and clear from all grass and rubbish, as it harbors slugs, snails, and other pests. Salt spread thinly over the surface, and then gently watered will kill all vegetable life on the walks, but care must be taken that the salt is not allowed to run on the beds, as it will thus destroy the plants.

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Garden Calendar for May.

— Plains. —

Kitchen Garden.—Continue sowing all kinds of seeds recommended for last month in small lots for home use, but largely for main crops for market. The seeds already sown should now be germinated, and should be frequently watered during dry weather. Amongst others, sow seeds of asparagus, beet, all kinds of cabbage, carrots, cauliflowers, celery, cress, endive, garlic, kale, kohlrabi, leeks, lettuce, onions, parsley, parsnips, peas, radishes, rape, salad plants of all sorts, spinnach, and medicinal, flavouring, and pot herbs. Plant potatoes where frost is not likely to be severe. Plant out cabbage, onions, and everything that is ready, and attend regularly to watering them. Dig and manure beds for main crops. Divide and replant in fresh positions all kinds of herbs, &c. Put a coat of mulch on beds of asparagus, rhubarb, seakale, and strawberries. Save the largest and best of cucumbers, melons, pumpkins, squashes, &c., for seed. Keep the hoe and rake constantly going to keep the surface loose.

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Flower Garden.—When the leaves and stems of Dahlias, Amaryllids, Lilies, Tigridias, Tropæolums, and other bulbs, &c., are quite dry, the bulbs and roots may be taken up and be stored away in dry sand until middle of September next. As a rule, the true bulbs will do better if left in the soil. Plant all sorts of hardy bulbs, corms, and roots, a few of each weekly, in order to keep up a succession of flowers. Sow seeds of all frost-resistant plants in small beds or boxes, except the strongly-growing sorts, such as Poppies, annual Chrysanthemums, and Godetias. Plant out some of the annuals already raised, and water them if necessary. Sprinkle lime and soot around these at night, to kill slugs and snails. Secure seeds of autumn annuals. Make layers of plants difficult to root from cuttings. Put in cuttings of all sorts. Do not prune any plants now, but give water liberally to those that have already been clipped. Spread and dig under manure before the wet sets in. Tie up Chrysanthemums, but not in a bunch.

Fruit Garden.—If loquat trees are freely supplied now with water it will greatly benefit the fruit hereafter; all trees of the citrus family should also have a good heavy watering, if rain keeps off and this has not been recently done. At the end of the month begin to prune the earliest kinds of stone fruits. The almond, peach, and nectarine need heavy pruning, but care must be taken not to cut away the fruit spurs. Sow pitts or stones of almonds, apricots, peaches, nectarines, and plums, and pips or seeds of apple, pear, quince, &c., to furnish stocks for grafting with superior varieties of each upon its own kind. Gather the apples and pears when ripe enough, and store them unbruised on shelves in a dark, cool, well-ventilated room, which is free from draughts.

The Blackwood Experimental Orchard.

The Blackwood orchard at first was intended for experiments, and as demonstration ground for various stone fruits that did not succed at the Government orchard at Mylor. It has now been decided to duplicate every variety of tree at Mylor, so that its commercial worth may be ascertained and a standard set in nomenclature. When this work is completed Blackwood will have robbed Mylor of its utility, as being much more convenient to the city, visitors and orchardists will be able to inspect it without any great loss of time. The varieties at Blackwood now include a wide range:—Almonds, 37 varieties; olives, 27 varieties; loquats, 16 varieties; plums, 340 varieties; apricots, 108 varieties; nectarines, 80 varieties; peaches, 300 varieties; figs, 100 varieties; cherries, 214 varieties; pears, 120 varieties; and apples, 560 varieties. These figures will be augmented when the transfer from Mylor, by means of buds worked on stocks grown at Blackwood, is complete. The figs also include 13 Capri figs and 63 Smyrna figs, and as these sucker young trees are propagated for planting in the Government orchard at Berri. From the collection of fruits it is certain that there will be some varieties new to the State that will be of great value in commercial orchards. This season peaches and nectarines have produced some fine fruits, and among the latter that are described as especially worthy by Mr. Quinn are varieties known as Zealander, Gold Mine, New Boy. River's Orange, and Lippratt's Prolific.

Some Interesting Experiments.

A number of pears are being tested upon seeding pear and quince stock. In rich soil the latter are often recommended, but in poor soil they do not allow of the growth that is made under such conditions by pears on pear stocks. A somewhat similar experiment is being carried out with cherries, which are worked on stocks that promote luxuriant growth, on stocks that tend to slower growth and earlier and heavy fruiting, and on composite stocks, where "the cropping" stock has first been worked on the "wood-making" stock. Peaches are also the subject of a similar plan of experiment, the stocks used including seedling almond, peach, Myrobolan plum, apricot and peach almond. Ordinary peaches may be said to give best results when placed on peach stocks, but in dry soils almond stocks have some vogue. Late yellow peach varieties usually do well on almond stocks, and the experiment has been made of working the fruiting variety on the yellow peach after the latter has been worked on almond. The results of these tests will only be determined by observation over a series of years. The same remark applies to various pruning tests. In one test peaches are to be pruned in winter only, in winter and summer, and in summer only. In another three varieties each of pears, apples, cherries, and plums, are divided into rows, to be:—1, pruned three winters, then every second winter, and 2, pruned every winter and then summer pruned. The results will provide a comparison of the merits of continous as against intermittent pruning. Data on the subjects of pruning and thinning of fruits, in the maintenance of regularity, of cropping and quality of fruit, will be compiled for observation on export apples severally treated as follows:—1, pruned every year, fruit not thinned; 2, then fruit thinned only; 3, not pruned and fruit not thinned; 4, not pruned, fruit thinned. A number of trees have designedly been left unpruned, and while they have as a consequence come into bearing quicker than regulated trees, they will probably drop behind in results through lack of sap concentration.

Tillage Tests.

The effects of deep cultivation is being tested with apples, plums, peaches, and apricots planted on similar land. In No. 1 block the land is subsoiled, ploughed once, and summer tilled; in No. 2 subsoiled, ploughed twice, and summer tilled; and in No. 3 not subsoiled, ploughed twice, and summer tilled. A row of apple, pears, and peaches two years old in the manurial test has been reserved for an experiment with sulphate of iron to determine its efficacy or otherwise in preventing curl leaf of the peach and diseases common to apples and pears. At Mylor the experience of one season with apples under soil treatment with iron showed a pleasing immunity from bitter pit, but whether permanent effects can be thus secured remains to be proved. At Blackwood it had no effect in curtailing the development of curl leaf in the peach, and the apples have not come into bearing. There are many other interesting points demonstrated at Blackwood, where in the course of a few years the State will possess a demonstration horticultural area full of lessons to theh producer.

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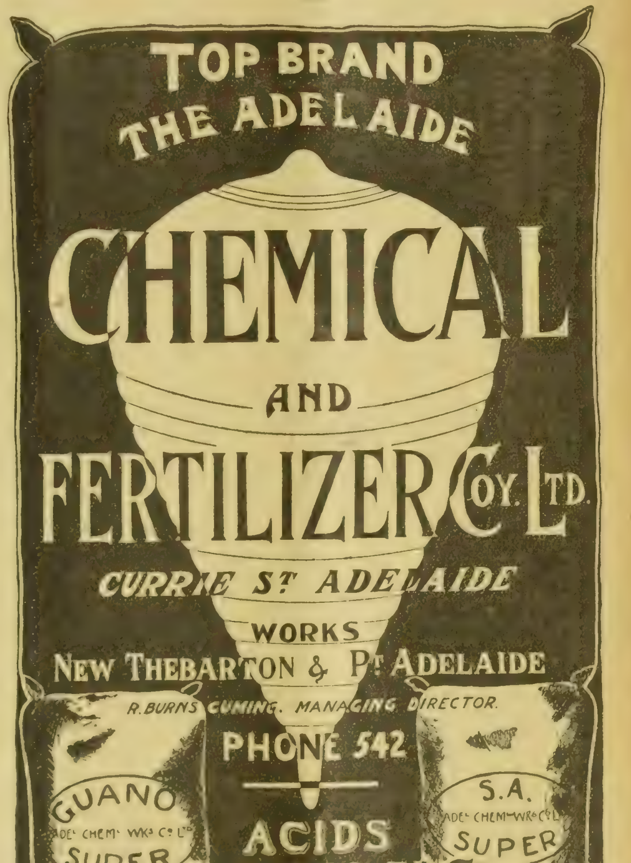
Though the prohibitionists may talk and the local optionist may rave, and many other people imagine various things, there is no doubt that the use of stimulants will continue as long as the world goes round. With spirits as with all commodities there are the good and the bad. This is unavoidable, but is certainly unjust to condemn the former for the faults of the latter. There are many brands of wines and spirits which the consumer may use with the fullest confidence of getting a pure, healthful, and unadulterated article, the "Curlew" Brandy, of which Messrs. Downer & Co. are agents, has stood every test, both of time, as well as medical and analyatical examinations. It is largely used in the home, and carries the recommendation of eminent physicians as a desirable stimulant for use in public and private hospitals. The "Curlew" label, therefore, on a bottle may be taken as sufficient guarantee that the contents are what they are said to be, a good honest article.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Lime-Sulphur as a Substitute for Bordeaux Mixture in Summer Spraying.

"American Horticulture."

Most every fruitgrower is familiar with lime-sulphur spray used as a winter spray for the destruction of the San Jose scale, but very few know or have heard of it being used as a summer spray, both as a combined insecticide and fungicide. While Bordeaux mixture had proved such a friend when we first commenced using it, in the last few seasons it had proved so treacherous and wrought such damage at times, that one was never sure when using it what the result would be. It creates such an uneasy feeling among growers, that consequently we are ready and willing to try anything that has possibilities. We had heard that the growers of California were using a prepared lime-sulphur mixture known under the name of Rex very successfully, and also that away up in the north-west they were using the same spray, and also another brand of the same thing under the name of Niagara. As the climatic conditions in both these sections were so different from our own the only way to prove whether we could use it here as successfully or not was to get it and try it. So 100 gallons of Niagara and a little later 250 gallons of Rex were ordered. Then the question was how much to dilute it. Could get no word from California, but the north-west had reduced it 1 to 15—that is, one gallon of the mixture to fifteen gallons of water for apples, and 1 to 20 for the peach, without injury. So, taking into account the difference between our two climates, decided to reduce it still further—making it 1 to 25—but after corresponding with Prof. W. M. Scott, of Washington, D.C. on his recommendation reduced it 1 to 40. The first spraying, before the blossoms, had already been done with the Bordeaux mixture 4-4-50—before the lime-sulphur mixture had been received. It was the first intention to use simply the arsenate of lead spray just after the blossoms fell, putting it on very heavy. That is, using about 4 or 5 lbs. of arsenate of lead to the 150 gal. tank, but putting the spray on very heavy, so there would be no doubt about getting a little of it into the blossom end of the little apple, and then following it right up with the Rex spray 1 to 40. But owing to excessive wet weather delaying the first spraying, this plan had to be abandoned and the Rex and arsenate of lead had to be combined. The Rex lime-sulphur was used in the main part of the orchard and the Niagara in the part set aside to testing the different makes of arsenate of lead.

— A Mysterious Burning. —

After a little over half of this orchard had been sprayed, noticed a slight burn where we had used the Rex. but none where we had used the Niagara. Thinking that there was a little too much burn, and the scab showing up very plainly all over the orchard, changed the spray for the Bordeaux, but only used the 2-4-50 mixture, with a result of the worst burn we ever experienced, or ever saw in any other orchard. Now this burn proved considerable of a mystery. Thorough investigation failed to find a thing wrong in any of the materials of which that spray was composed, and every hand on the job was ready to swear that the right quantities were used. It is true that for those two same days, the atmosphere had that peculiar condition when everything burns. Neighbouring orchards showed burn also for those same two days, but not nearly so bad, and they were using 4 lbs. copper sulphate. This burn was so bad, that for a time, it was questioned whether those trees would pull through or not, but being strong and vigorous, having been well cared for in previous years, they soon commenced to put forth a new set of foliage, but made very little wood growth. After the new leaves had pretty well developed the trees were covered with woolly aphis, but a spray of Rex 1 to 40 soon wiped them out.

— Prepared Mixtures Preferable to Homemade. —

This spray also showed a slight burn Arsenate of lead was also added to this spray. Now it is claimed by good authorities that you cannot combine arsenate of lead with lime-sulphur mixture—that one neutralises the other. If this is a fact how much of this injury was due to this cause? It will take higher authority to answer this question, as it is work for the chemist. The home-prepared lime-sulphur mixture will never become popular with the masses, on account of the trouble of making it. Then again it is difficult to spray, on account of clogging the nozzle at times. If the Rex or Niagara, or any other prepared mixture of the same materials can compete successfully in price with the home-made and be just as strong there is no question but what they are the best, and if they only prove successfull will be the easiest spray made, for you do not need even an extra barrel, for you can dump your quantity right into your tank of water and go to spraying. They are in the form of a clear amber liquid with no sediment. The home-made keeps an extra hand all the time watching the "pot," while the prepared would do away with the mixer entirely. Then, again, it is such an easily prepared and convenient spray to use on things planted around the house and garden. All you have to do is to put about a pint of this prepared liquid into a 3-gallon knapsack or Auto Pop sprayer filled with water and go to work. We have a very choice grape—name unknown—but suppose it must be one of Rogers' Hybrids, as we bought quite

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a lot a number of years ago. It was almost impossible to get it through any season without losing its foliage, followed, of course, by the fruit. But this spray just carried it through in perfection.

— Some Interesting Conclusions. —

The same thing with the roses and strawberries; it does not leave a spotted leaf. Also found it fine for rust or blight on celery. In fact, it was an ideal spray on everything in the garden line, but it couldn't get away with the old-fashioned blister potato bugs. There was one thing about it, though; don't know whether it was owing to the season or the spray; you couldn't go over ten days or two weeks without spraying. Now if this spray will kill San Jose and other scale by contact, how strong will it have to be to kill the codlin moth and other insect eggs; and will a tree in full foliage stand it at that strength? This is a question that I should think could be worked out this winter in the laboratory by some enterprising student. Another dream; even if we cannot make the spray strong enough to kill the eggs, if we could gauge the main hatch and time one of our sprayings accordingly we would make some of those little insects think that a small chunk of "hereafter" had struck them sure.

Now, while these prepared sprays have not proved much of a success, this season, where is there one that has? Old and tried sprays that we thought we knew all about, have gone back on us. Even arsenate of lead, if we had been trying it for the first time, we would have pronounced a failure. This has been a very peculiar season, the like of which we have never experienced before. There was so much damagd foliage, and it was so susceptible to everything that touched it, that no matter what spray you used, or how much reduced there would be some injury. There is nothing that we are sure of or can verify this season, so the only thing we can do, is, in the vernacular of the race track, when under certain conditions they declare "all bets off," to declare all sprays off.

—H. E. Aldrich, Neoga, Ill

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Repairing Defective Trees with Cement Filling.

It is only recently that very much attention has been given to the filling of cavities in trees. This is now being done quite extensively, and better work is being accomplished in this line than heretofore.

The question has often been asked whether it is worth while to dig out a decayed cavity of a tree and fill it with cement or some similar substance. We are free to confess that we have never had an opportunity to examine many trees which have been filled for any length of time, especially when the filling was well done, and therefore have not sufficient data to ascertain whether this method of treating trees always prevents further decay. Until we have an opportunity to carefully examine specimens that have been filled for many years, we cannot be absolutely sure whether the types of filling now in vogue are successful in preventing further decay.

We have observed sections of large trees which have been filled for a few years which showed that decay was not arrested completely, but it is hardly fair to assume that the tree we examined represented the best workmanship in this direction. We believe, however, that if a rotten cavity is thoroughly cleaned out and properly filled, the life of a tree can be greatly extended, and that it is possible to prevent further decay of such cavities. The best method, however of treating tree cavities may not as yet have been discovered. We believe that it is the best plan to make all cavities wider at the center than at the exterior surface, so that the filling substance will be wedged in, as it were, and have no opportunity to fall out or become displaced.

Of course, cavities after being thoroughly cleaned are treated with some antiseptic, such as corrosive sublimate, creosote, paint, etc. Creosote possesses more penetrating power than a watery solution of corrosive sublimate, and probably for this reason it is more effectual in reaching portions of the mycelium of the fungi which might be still remaining in the wood near the chiselled surface. Probably formalin at the rate of two to four parts of formalin to 100 parts of water, as well as many others substances, can be used to advantage, but the use of such disinfectants on trees is entirely in an experimental stage, and their value as antiseptics is problematical.

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Fruit Tree Stocks.

(From Victorian Journal of Agriculture.)

What the foundation is to a house, the stock is to a fruit tree, and if trees are worked on unsuitable stocks disappointment will result, the tree will cease to be healthy and vigorous, and ultimately die or become useless.

Apple.—In Australia we have made quite a new departure with regard to apple stocks. In the old country the seedling apple, or more commonly termed the crab stock, is the one used by nurserymen and orchardists, except in the case of dwarf apple trees, when the "Paradise" stock is used. Here, however, is was found, after some years of experience, that the crab stock was so subject to the woolly aphis (Schizoneura Lanigera) that it was almost impossible to cultivate apples at all; in fact, apple culture was nearly at a standstill when the two now so well known blight-proof varieties, "Winter Majetin" and "Northern Spy" were introduced as stocks. After a certain amount of prejudice was overcome, growers on all hands recognised this discovery as a boon, and cultivators adopted it freely. The "Northern Spy" has proved better adapted as a stock than the "Winter Majetin," and is now almost exclusively used.

There are several other blight-proof kinds of apples which could doubtless be used as stocks, but there is no need to increase the number except for special purposes. Among thoughtful cultivators the question suggests itself. Is it desirable to keep to one stock only, and propagate by layers, roots, or grafting of roots? I think it is, and to prevent the stock from becoming weaker in its constitution, from constantly working and re-working upon the same variety, I have worked "Majetin" on "Spy," and "Maggs Seedling" (another blight-proof kind, and robust in constitution) upon the "Sup," with the best results.

For dwarf-apple culture the "Spy" can be used, and the "French Paradise" worked upon the "Spy," and the desired kind again worked upon the "French Paradise." This, however, becomes tedious. We have now in this State, raised from seed here, a "Paradise apple tree of dwarfing habit—free surface rooting properties very easily propagated, and upon which the desired kinds may be worked direct. All kinds appear to thrive admirably upon it, and it is quite blight-proof.

It may be mentioned that even now there are localities where the old Crab stock or seedling apple can be used with safety, viz., well drained, deep, sandy soils; but such stocks are now so scarce that it would be difficult to obtain any from nurserymen. The blight-proof stock is now almost exclusively used.

Planters must take great care that their trees are worked sufficiently above the surface of the ground to prevent the scion from striking roots into the ground, and displacing the blight-proof stock, thus rendering the whole tree roots a blighted mass.

Apricot.—This is, perhaps, the most difficult to deal with in regard to stocks. Great dissatisfaction has been experienced by growers in consequence of their trees breaking off at the point of union with the stock while in perfect health; and in other cases by the trees having a stunted growth and sickly appearance. This is generally due to unsuitable stocks.

The plum stock now generally used is a variety of the "Myrobolan," called "La France," which is easily propagated from cuttings, and does not sucker, but such varieties as the "Montgamet" and "Large Early" type, when worked upon the above stocks are very apt to blow off at the union of the tree with the stock when fully grown. I much prefer the common "Mussel" plum as a stock, as it succeeds well in most soils and climates, and the most popular market sorts do well upon it. The advantage of the plum stock over the seedling apricot is that it will adapt itself to almost any soil, whereas the seedling apricot is only suitable where the soil is light and warm, or well drained, the climate warm, and the rainfall not excessive. The seedling apricot is much sought after by planters in the warmer and drier districts of the State, and in many cases it does well. It stands much drought, and will grow when many other trees are at a standstill. It is, however, apt to grow too vigorously at the expense of the size and quantity of fruit, whereas the plum stock, which has a more dwarfing tendency, grows finer fruit as a rule. As in most fruits, the theory that if fine fruit is wanted the stock must not be too vigorous holds good with this as with most fruits. It is much better for a scion to somewhat overgrow the stock than for the stock to grow faster than the scion, or upper part of the tree. In the one case, well-developed fruit and heavy crops are the result, while, in the other, thin crops and poor fruit are the rule. The nourishment which should go to the fruit expends itself in wood and leaf—the cherry is a striking example of this. Some growers work the apricot upon the almond—a most unsuitable stock. Never plant trees upon this stock. The peach is a most desirable stock in localities where the plum does not do so well as the peach.

Peach.—The peach stock raised from the stone is, doubtless, under almost all circumstances, the best stock for the peach. Some difficulty is often experienced in getting the stones to germinate; some seasons they come up freely and in others very few grow. The stones from one season's crop of fruit will grow freely, while those from another season's

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crop will nearly all fail. Stones saved from medium-sized mid-season's varieties are generally the best for planting. The stones, immediately they are collected, should be placed in the ground in a well sheltered position, and covered over with sand and allowed to remain there until planting time. When once the stock is above ground it is easily managed; it roots very freely, throws plenty of fibres, and a tap root which is easily managed, and does not require to be removed from the seed bed till the young tree is ready for transplanting to its permanent position. If the stones are planted in too rich soil, then a strong tap root is formed at the expense of fibrous roots; in such cases the tree should be removed when young. If possible, always bud the stocks the same season as they come up.

There are localities where the almond stock is preferred to the peach—not only preferred, but becomes necessary, as the peach refuses to grow and succeed on its own roots. In such districts as Swan Hill and south of Melbourne growers will, on no account, plant peaches upon any other stock than the almond. The effect produced upon the growth of the peach tree in these districts (when upon the peach) is remarkable. The tree assumes a thick bushy habit of growth, throwing out innumerable useless lateral shoots with no bearing wood. The tree remains a thick bushy shrub, while those on the almond produce quite a different growth—fruitful shoots are made, covered with well-developed fruit buds. The leaves are of a paler green than upon the peach, and none of that useless unfruitful spray is made, and the result is good crops of fine well-colored fruit.

Plum.—Several kinds of stocks are used for plum trees, viz., the "Julien" seedling plum stock, cherry plum "La France" (a variety of "Myrabolan"), and the "Mussel" plum stock. During a long experience I have found no better stock than the lastnamed, if judiciously selected. The "La France" stock is now used by nurserymen. It will not stand excessive moisture, or thrive in badly drained grounds, and often in orchards when the trees are fully developed and in bearing, trees will suddenly die completely out in one season, especially such as the "Yellow Magnum Bonum" and that type of plum

Sometimes seedlings are recommended, chiefly, it is maintained, because such do not sucker. This is quite a mistake. I tried the experiment several years ago, and found that those trees worked upon seedlings threw up many more suckers than those worked upon the ordinary sucker stock. It has been found that in many localities the "Cherry" plum has proved a good stock, causing robust growth and being in all respects desirable. All kinds, however, will not succeed upon it. The "Diamond" plum, and others of similar type, the "Orlean," and some others, succeed well upon it. Experience must decide as to which kinds are best adapted for the "La France" and "Cherry" plum in the particular districts in which they are grown. The two varieties mentioned are the only stocks which do not throw suckers, and for this reason are desirable to use when suitable soil and locality to be grown in.

Cherry.—Experience has shown that the stock in general use for the cherry in the old country is not adapted for these States. There, the seedling "Mazard," or wild black cherry, is used as a stock for orchard planting, and the "Cerasus Mahaleb," or perfumed cherry, where dwarfing is required. Neither of these stocks is of any use here. Some few years ago there was a great demand for the seedling cherry stock, which, as a stock, is almost identical with the "Mazard," especially when raised from black cherries. At the period referred to, it was claimed for this stock that it had a hardy constitution, would attain a large size, and not throw up suckers like the stock generally in use. But, as predicted at the time, its popularity was but shortlived. It was found that the varieties worked upon this seedling stock grew splendidly for a few years, and had the appearance of making large, well-developed trees; but the vigor soon ceased, and the trees began to die off, and those in more favored spots that did not die bore but scanty crops of fruit of small size and inferior quality.

The "Mahaleb" cherry of English shrubberies is much used in Britain and on the Continent as a dwarfing stock. Why cultivators should have selected this stock is a matter of surprise, as with us its dwarfing capabilities are not manifest. It rather induces a vigorous growth for a while, and then the trees die out; this happens when the "Duke" and "Kentish" classes of cherries are worked upon it, and they are the classes specially recommended for this stock. The old cherry stock in use from the foundation of Victoria, and now in general use, is the best stock known here. It is, as all growers know, a small red cherry, ripe just before Christmas; it is a good cooking variety, and pleasant to eat. It is one of the "Montmorency" section, much like a "Kentish." It is, however, not faultless; it throws up abundance of suckers, and for this reason is somewhat troublesome; still I believe it is the best stock for cherries. It is not generally known or recognised that the fact of this stock not keeping pace with the kinds worked upon it is its great virtue. It acts upon the scion as the quince does upon the pear, and the "Paradise" upon the apple. It is because the scion overgrows the stock that the tree becomes so fertile, and its fruits so fine; in fact, it is a dwarfing stock. This stock, as far as my experience goes,

(Continued on page 544).

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Vegetable Garden.

Vegetable Hints for May.

All plants belonging to the cabbage family should now be planted out. It is necessary to avoid bending the roots up, and to have them in contact with the soil. In dibbling them in, first puddle the roots in a mixture of soil and manure. Then make the hole perpendicularly with the dibber, take a plant by the leaves in the left hand, let the roots hang straight down the hole, drive the dibbler slantingly, so that the point will come elbow the former hole, and bring the top of the dibbler up towards the left hand. This will press the soil up against the roots and completely fill the perpendicular hole. Fill the other hole any way. If it is filled with old manure it will be all the better for the plant Cabbages will take a deal of manure, and the surface of the soil cannot be stirred up too often; but not more than two inches deep. The Early York is the best cabbage for planting at all times, and should be planted in succession fortnightly to keep up a supply. There is truly only one species and variety of cauliflower; all the rest are broccoli, and most of them quite as good as cauliflower. Plant large sorts of cabbage at least four feet apart. The same with cauliflowers, sprouts, &c.

Potatoes should not be planted where the night frosts are likely to be severe. A slight frost may be stopped from injuring the plants by sprinkling them before sunrise with the coldest water procurable. Water from a well or tap will be too warm, and will kill the plants. Water that has been exposed to the air all night will do. Plant the setts with the eye up, pressed into the soil; cover to a depth of four inches, and make the plants one foot apart, in rows thirty inches apart. The setts may be covered first with three inches of old rotten straw, and then with two inches of light soil. It is disadvantageous to have too many stems to a plant, as this results in small tubers. A plant with one or two stems will produce large potatoes.

Unless a cabbage is wanted for seed, the stump should be pulled up when the head is cut. If intended for seed, cut the head, and use it, mark the stump, and if the land is required for other purposes replant it in rich, light soil. It will put forth a lot of sprouts which will bear good seeds. It is most important that there shall be no other variety of cabbage, turnip, kohlrabi, &c., near, as the bees will carry pollen from the flowers of one to the other, and spoil the lot.

Onions should be planted out when about the thickness of a lead pencil. If the roots are very long, they may be cut back to an inch long, and the tops should be cut back also in this case. Do not bury the bulb, but see that the roots are firmly fixed in the soil. The bed should be level, and of a light nature. Soil for onions can hardly be too rich, and well-decayed stable manure is very good for them.

Plant out any beet that may be ready, but it is probable that it will go to seed about September unless used before. Now is the time to begin sowing seeds of beet. It is best to sow in beds, and transplant carefully, when the plants are very young, in beds of fine soil. Be sure not to injure the roots, and to avoid bending the taproot upwards when transplanting. Rows for red beet may be 18 inches apart, and one foot between the plants for small sorts, and rather wider for larger kinds.

Silver beet requires a richer soil than red beet, and rather wider spaces. The mid-rib is often cooked separately, and served with white sauce. The green part is used in place of spinnach.

Sow spinnach in drills thinly. The soil must be rich, and broken up well to a good depth. The plants ought to be three to four inches apart, and the rows two feet apart. Water frequently, pick the fat large leaves day by day as wanted. Sow fortnightly, or sow sufficient for the household requirements. If sown too thickly, the extra plants may be transplanted, or else cut out for use when large enough.

Lettuces must be kept growing vigorously all the time. The soil should be light, deep, and rich. The plants should stand at least a foot apart for the small sorts, and two feet for the largest. There are many varieties of lettuce, and tastes differ; but the old cabbage lettuce still holds its own for a standard, and the Green Cos is a good early sort. The hoe must be kept at work on the lettuce bed, and the surface should never be caked down.

Artichokes and cardoons are hardly known to our people, although in England they are grown in many gardens, and on the continent of Europe they are cultivated largely. Roots and setts should be planted now in deep, rich, light soil, at distances of 3 ft. by 6 ft., or a little closer if space is wanting.

Plant out celery in trenches 18 in. by 18 in. The bottom of the trench should be pulverised and well mixed with old manure, and the plants should be along the middle at a foot apart. Water freely and frequently. Sow more seeds of celery in beds.

Sow small lots of radishes weekly in well-prepared beds. There are radishes of all colors and shapes, and some of each sort should be sown, but separately in the bed.

Sow small beds of various salad plants at intervals. It is not worthwhile to raise enough for a large city all at once, and then to have none left for next week. Lettuces and other salads can be sown rather thickly, and the plants cut when quite young. There are quite fifty sorts of plants that can be used in salads.

Plant seakale in very rich light soil, in rows five feet apart, and the plants eighteen inches apart. When the plants are about ten inches high they can be bleached by covering them up from the light; but as a rule the growth is covered as fast as it is made, which is the better way. When wanted for use, cut the leaves and stalks, clean well, boil quickly in salted water, and serve with melted butter and sippets of toast.

In the hilly districts get beds ready for rhubarb, and seakale. Use plenty manure, and dig deeply, and pulverise the soil well.

In the hills plant out strawberries on the higher lands. When taking up the plants take about six inches of the

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runner, and in planting bury the end of the runner in the soil. In Europe gardeners use old mortar as a manure, and sometimes use marl, well mixed in the soil. Manure which has been sprinkled with calcined gypsum whilst gathering would probably be beneficial to strawberries.

Asparagus should be planted out now. The soil should be rich, deep, and sandy. If water is within three or four feet, it will be a good place for asparagus, although it will grow where water is a hundred feet below if a little can be given above every now and then. Get every root with the "crowns" if possible. Put them four inches deep and a foot apart. Frequent light applications of manure are better than occasional heavy dressings. When starting growth some liquid manure is good. Salt may be given, but is not absolutely necessary. In April the plants are dry, and should be cut off; and the bed covered with three inches of old manure, which should be dug under very lightly in August. No "grass" should be cut until the third season, and then only a little; but after the fourth year a good lot may be cut. In digging great care must be taken not to injure the crowns beneath the surface. Of course a certain number of shoots must be allowed to grow and mature from each crown every year, else the bed will die out.

Turnips can, of course, be sown still, and regularly about once a fortnight. The seeds should be sown thinly and covered lightly, and then the plants will need to be thinned out to eight or twelve inches apart.

Kohlrabi is a kind of cabbage which bears a large bulb on the stalk, upon the top of which are a number of leaves. The leaves can be boiled for greens, and the bulb when about half-grown is good if used like turnip. The stems which run up for seed are nice if boiled just before the flowers appear. Plant out kohlrabi now, and sow a few seeds for later planting.

Sow some more carrots and parsnips, onions, chicory, endive, broad beans, peas, salsify, scorzonera, cabbage, broccoli, Chinese cabbage, leeks, chives, parsley, cress, and other vegetables.

Put in almonds, stones of apricot, peach, plum, all kinds of nuts, pips, and seeds, to produce young trees to be grafted later on with best varieties of their own family.

The beds for strawberries should be four feet wide, and the young plants should be one foot apart each way. Paths between the beds should be fifteen inches. Weeds should be destroyed at once, and the surface kept always loose. Seaweed is an excellent mulch to keep the berries clean, and to drive slugs and snails away. When the flowers appear the plants want a deal of water.

Plant raspberries and blackberries. The canes which bore last season ought to have been cut before now, and all weak shoots also removed. Make the rows five feet apart, and plant strong young canes four feet apart. They should be strongly rooted. If the canes are cut back close about September the fruiting will be delayed until the following year, but the fruit will be more abundant and finer then.

Begin to prune the earliest kinds of stone fruits, and follow on with the later sorts when the leaves have fallen. Early pruning is believed to cause early growth, and in localities subject to late frosts it is advisable to leave pruning till a later period.

Olive trees should be planted now. Plant good varieties—not wild useless things, unless they are to be grafted. Olive trees must be pruned, and it will be well if they are kept down to a height of seven feet, or thereabout, so that ladders shall not be required for gathering the fruit

Get land ready for planting rooted vines about June or July. Plough deep, and pulverise as much as possible.

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(Continued from page 541).

is adapted for every variety of cherry.

Pear.—As with the peach, so with the pear; the stock most generally adapted for the pear is the seedling pear stock, raised from the hardiest known kinds, which, as a rule, seed very freely and produce good stocks. As is usually the case with most fruits, the finer kinds do not produce much seed, and stocks raised from such are not generally robust. But where one seed is saved from pears of delicate constitution, hundreds are saved from hardy kinds, so that, generally speaking, hardy stocks are used.

I would advise that pear suckers never be used; if they are they will prove a great disappointment. In the early days, when seedlings were scarce, resort was had to suckers, and, as a matter of course, it was only from trees that suckered abundantly that any quantity was obtained. Trees from these were planted out, and the results were disastrous. Not only were thousands of useless suckers thrown up, but the trees refused to bear, though the same kinds on the seedling pear bore regularly and heavily. The trees on suckers had to be rooted up as entirely worthless. As a rule, and in most localities, the seedling pear stock is the most desirable for pears.

There is also a variety of quince, a kind of small "Angers," which is used most successfully, and upon which some kinds do well, even when worked directly upon it. As there are but very few kinds of pears that do well when worked directly upon this quince, it is usually necessary to double work on the stock. First of all, work such kinds as "Beurre d' Amanalis," "Louise Bonne of Jersey," or "Beurre Diel," upon the quince; allow them to make yearling shoots, and then work upon these the desired sort, when perfect health and vigor will be attained. This mode of culture is most interesting and profitable, especially in the cooler districts of the State, where the pear-on-the-pear takes so long to come into bearing. On this quince stock fertility is attained very quickly; the trees grow comparatively slow, but fine fruit and quick returns are the results. This mode of culture wants to be better known, when it will be largely adopted in the climates referred to.

There are other stocks used for pears, such as the "Hawthorn" and "Mountain Ash," but these are not necessary or desirable where the proper kind of quince is obtainable. It has been affirmed that the pear-on-the-quince is but short-lived; this is not the case. In France there are trees of great age, where this system of culture is largely practised with most satisfactory results; likewise in various parts of Victoria, where they have been planted for many years, they will be found bearing heavy crops of good fruit each season.—By C. T. Cole, Victorian Journal of Agriculture.

The Farm.

Paspalum Seed.

Paspalum seed, even that which is reported to be hand-shaken, is so often disappointing in its results that special interest attaches to any practical suggestion calculated to give a better chance of germination. In this connection a New Zealand farmer gives it as his opinion that the best method is to cut the seed-heads about 18 inches long with a reaping-hook, and place them in small bundles on the grass. Great care should be taken to handle it gently, as the ripe seed easily falls. Each day's cutting is taken at once to the barn, where it is placed in rows crossing each other, so as to allow free ventilation. In three days the bundles are shaken on a sheet or floor, the ripe seed coming out freely, and the unripe seed and husks, which remain on the stalk, are carted away and spread on the paddocks. The good seed is then placed on sheets spread out to dry, and sieved, after which it is placed in the seed bins. "I have sown the seed in October and November, and cut the ripe seed in the following March and April for first crop, and a month later cut it again, thus showing that it does not take five months for the seed-heads to ripen. As to leaving the seed in stooks, that is wrong. In the first place, it is almost impossible to stook paspalum grass. To show how easily the seed falls when ripe, a heavy wind or rain will send a great deal to the ground, which I know from experience, having lost much seed this season from this cause. Seed grown by men of experience can be brought up to 90 per cent. germinating-power. The grass can also be cut with machine for seed. Canvas covers are used along the row of cut grass, which is taken up and shaken on the sheet, and then thrown away for hay. You will in this way get only the very best seed, the unripe going with the hay. The machine will lay the grass down more gently than if cut by hand, and although you will get less seed it will be of the best quality."—"Sydney Daily Telegraph."

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Handling the Cow at Calving.

Never milk a cow before she calves. Give her exercise. A mile or two of a walk is the best thing to loosen up her udder; it also puts her blood in proper circulation, and keeps her bowels right. Do not exercise a cow after she calves. If her udder is caked very badly, there is no cure like ten to fifteen minutes' bathing with hot water and soap—hot as the hand can bear it, and kept nearly that hot by having a large quantity in the vessel used.

After bathing thoroughly, rub on her udder some whisky or milk liniment. A cow's udder is very sensitive, and the whisky or liniment is to keep it from getting cold too quickly. On the other hand, you may rub with a cloth until perfectly dry.

Do not be in too big a hurry to milk out after a cow calves, and do not milk her out for twelve to twenty-four hours after calving, and then not unless her bowels are working.

Do not give a freshly-calved cow too cold water to drink, else she may get a chill and retain the afterbirth, but give her all the lukewarm water you can induce her to take. There is nothing better to loosen the bowels. When the bowels move (it may be eight or twelve hours, or longer) you may rest assured your cow is safe from fever.

No matter how loose the bowels are before calving, they are very slow in acting afterwards. Fortunately, the cow is always thirsty after calving, and the best plan is, to give her a bran mash, filling the pail with water, and also have another pail ready for her.—Agricultural Gazette.

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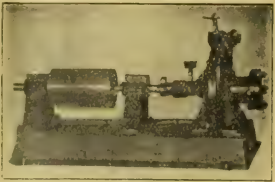
Matching Farm Horses.

Horses on the farm are so frequently worked in pairs that it is very necessary they should be well matched, says a writer in The Australasian. By this it is not meant that the team should be closely alike in color, size, and general appearance. It is desirable that they should be so, but that is only one, and by no means the most important, part of the matching. It requires a good deal of skill and judgment to bring together a pair of horses that resemble each other in all characteristics sufficiently to work in harmony, and action comes first in this connection. Style is required in the action of any class of horses, and a team each of which stands up to the bit in about the same way is attractive to buyers, and pleasing to the man who drives it. A team ill-matched in regard to action, strength, and staying powers is a liberal source of irritation, no matter how nearly alike in colour the horses may be. Proper action, that is, strong, clean, vigorous movement of feet and legs, is highly desirable, and if it can be combined with general conformation and colour, so much the better. Size, to a certain limit is fairly important. The Farmers' Advocate says:—"A difference of a hundred pounds or so in weight doesn't matter greatly when a pair is being matched up, but if much more than that, the difference in size will be so clear as to detract from the value of the team. Size is important, but it comes after strength, just as strength and conformation follow action in relative importance. Colour comes last of all in the major points to be considered. A difference of colour, however marked, is among the least objectionable features in a team. Yet, strangely, some men think it the all-important consideration, and will match up horses so unlike in action and temperament that one whiffle tree is always scouring the waggon-wheel, while the other is drawing ahead keen and strong to the bit, so unlike in strength and conformation that one is fagged out hours before the other shows fatigue; but if the two stand about the same in height, weigh up very nearly alike, and resemble each other in colour and markings, they are rated as a well-matched team. In reality, they are anything but matched."

Broome Grass.

This grass, known botanically as Bromus inermis, is also sometimes called smooth, awnless, Hungarian, or Australian broome grass. It is a vigorous, hardy perennial, with strong creeping root stocks, and smooth upright leaft stems, one to four feet high having loose panicles four to eight inches long. It is valuable for both pasturage and hay. The experience with this grass, together with the extended cultural tests made, show that it has remarkable drought-resisting qualities, and is very suitable grass for dry regions. It will thrive on extremely poor, sandy soil, and will return a fair crop; on good soil, however, it will grow rapidly, producing an abundance of pasture, yielding from one to four tons of hay per acre, and in some cases becomes a nuisance by its active growth and spreading propensities. Once established, it will adapt itself to various climatic conditions, and will withstand both frosts and drought. Its advantages over the native grasses are that it becomes green fully a month earlier, and does not dry up in the summer. The seed should be sown broadcast at the rate of 18 to 20 lbs. to the acre so soon as the ground can be got into good tilth after the first rains.



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Meat on the Farm and Station,

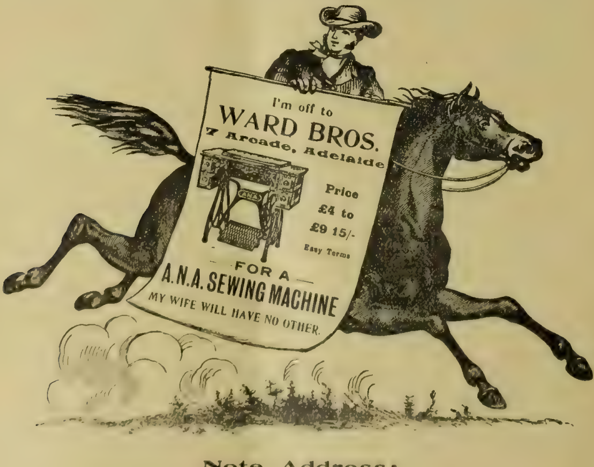
— Home Beef-Killing and Curing. —

Some means of raising the carcases of beef from the ground or floor, and a place to hang the lighter animals, should be provided. What these arrangements shall be depends largely on the amount of work to be done and the circumstances. A block and tackle with six inch pulleys will answer the purpose very well, and a suitable place for suspending.

The first step in killing and dressing beef is to secure the animal that it cannot get away under any emergency. For this purpose a rope three-fourths of an inch in diameter should be used. Put a slip noose in one end with a knot just far enough from the noose to prevent choking when drawn tight. It should at the same time allow the noose to draw tight enough to prevent danger of escape if the rope becomes slack. If the beast has horns, pass the noose over the head back of the ear and horn on the right side, but in front of the horn on the left side of the head. This leaves the face bare, and does not draw tightly on the throat. Without horns the rope must go about the throat. Attach an ordinary hay-fork pulley to a post, close to the ground, or to the barn door, or sill. Pass the rope through it, and draw the animal's head down as close as possible. Stun completely by a heavy blow in the centre of the forehead.

Bleed by sticking the animal just in front of the breastbone. Insert knife with the back against the breastbone and the tip pointing directly toward the spinal column at the top of the shoulders, cutting just under the windpipe, five to six inches in depth. The vein and artery cross at this point, and if severed the blood will flow out very rapidly. If stuck too deep the blood will flow into the chest cavity.

While it is almost impossible to get the best conditions for handling meat on the farm, a knowledge of the best principles may aid in getting a better quality of meat. It is very important that the carcases be cooled soon after slaughtering, and yet that they be not allowed to freeze. While the temperature cannot well be controlled on the farm, it is possible to slaughter when the weather is favourable to the proper cooling of the carcase. The most desirable temperature for cooling meat is 34 to 40 degrees, and an approach to these temperatures will give good results.



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In summer seasons it is best to dress the animal in the evening leaving the carcase in the open air overnight and carrying it to a cool, dark cellar before the flies are out in the morning. Very often a cool room in the barn can be used for the purpose if made dark. There should be no fresh paint, tar, kerosene or like substance around however, as freshly killed meat absorbs such flavours readily. Cooling is often hastened by splitting the carcases into halves, or even into small pieces. It is best, however, not to divide the carcase until the meat is firmly set unless absolutely necessary to prevent it from souring. For the best results in cooling meat the air should be dry, as well as of a low temperature; and free circulation aids greatly in carrying away foul odours and mould spores.

It is also important that flies and insects be kept away from the meat. If fly-blown, maggots will soon appear, and it will be very difficult to save the meat.

To do neat work in cutting up meat, one should have a short, curved knife (a skinning knife is as good as any), a 1-foot or 14-inch steak knife, a 26-inch saw, and an 8 inch cleaver. An axe may take the place of the cleaver, but is not nearly so useful. If a cross section of a large log can be had, it will answer for a block. A table, however, can be used in most cases.

In cutting any kind of meat one should always cut across the grain of the meat. Following this principle will result in uniform pieces, and the joints will be more easily carved after cooking. Cut to the bone with the knife, and use a saw rather than an axe for cutting the bone.

Beef should not be cut until the muscles have set firmly. When they are in the proper condition divide the halves into hind and fore quarters.

When meat is to be kept for only a few days a light coat of fine salt applied to the surface will be found sufficient if the meat is kept in a dark and comparatively cool place. Usually when meat is to be salted, however, it will be best to put it in brine of sufficient strength to preserve it for several weeks.

Meat must be properly and thoroughly cooled to insure good keeping qualities when cured. If salted before the animal heat is out, the shrinkage of the muscles causes the retention of injurious gases, giving an offensive odour to the meat. Neither should meat be frozen when salted, as the action of the frost will prevent the proper penetration of the salt, and uneven curing will result. It is important, also, that meat be cured as soon as cooled and while still fresh. Tainted meat may be cured, so that it will keep, but nothing in the line of preservatives can bring back the natural flavour when it is once lost. The safest rule to salt meat as soon as the animal heat is out. Ordinarily twenty-four to thirty-six hours after slaughtering will allow sufficient time for cooling according to seasons and temperature.

— Vessels for Curing. —

A clean hardwood barrel is a suitable vessel in which to cure meat. The important point is to have it clean and tight enough to prevent leakage. A barrel that has once held meat may be used again and again unless meat has spoiled in it. If used repeatedly it will be necessary to scald it out thoroughly each time before packing with fresh meat.

— Preservatives. —

Salt, saltpetre and sugar or molasses are the most commonly used preservatives, and are the only necessary ones for perfect curing and the finest quality of cured meats. Borax, boracic acid, formalin, salicylic acid, and other chemicals are sometimes used in preserving meats, but they are considered by so many authorities to be harmful to the health of the consumer that their use should be avoided.

Salt is an astringent, and when applied alone to meat renders it very hard and dry. Its action is first to draw out the meat juices. In a few days it will contract and harden the muscle fibres, thus shrinking the volume of meat. Saltpetre is even more astringent than salt. It is harmful to health. Four to six ounces per 100 pounds of meat is as much as it is well to use.

In corning beef, weigh the beef and allow eight pounds of salt to each 100 pounds of meat. Sprinkle a layer of salt on the bottom of barrel one-fourth inch deep, pack meat tightly to depth of five or six inches; then a layer of salt, and so on, with a good layer of salt on top. Let it stand over night, then for every 100 pounds of meat add four pounds of sugar, two ounces of baking soda, and four ounces of saltpetre dissolved in a gallon of tepid water. Three gallons more of water should be sufficient to cover this quantity. In case more or less than 100 pounds of meat is to be corned, make the brine in the proportion given. A loose board cover, weighted down with a heavy stone or piece of iron, should be put on the meat to keep all of it under the brine. In case any should project, rust would start, and the brine would spoil in a short time.

It is not necessary to boil the brine except in warm weather. If the meat has been turned during the winter and must be kept into the summer season, it would be well to watch the brine closely during the spring, as it is more likely to spoil at the time than at any other season. If the brine appears to be ropy, or does not drip freely from the finger when immersed and lifted, it should be turned off and new brine added, after carefully washing the meat. The sugar or molasses in the brine has a tendency to ferment, and unless the brine is kept in a cool place, there is sometimes trouble from this source. The meat should be kept in the brine forty-eight to forty days to secure thorough corning.—N.Z. "Farmer."

The Care of Heifers.

The most satisfactory way in wish to acquire a good dairy herd is to breed from good stock. But even when this is done the mistake is frequently made of not giving the heifers a fair show during the first season's milking. In order to ensure a good supply of milk from a heifer coming into profit, she must be liberally fed right up to the time of calving, without, of course, letting her get too fat. It is of special importance to stimulate the flow of milk as much as possible in young cows during their first lactation period, as the more milk they yield then the more does the milk-producing apparatus develop. Writing on this subject a contributor contends that as the first milking period of young cows is usually rather short, it is highly advisable to keep them in milk as long as possible—within reason, of course—as this helps to develop the milk-yielding capacity to a considerable extent. Even when the flow of milk has shrunk so greatly that it seems hardly worth while to continue milking the young cow, the operation should be continued so that the secretion of milk may be stimulated to the utmost. It is a bad plan to allow the young dairy cow to dry off too early, not only during the first milking, but also during the second. An early drying off of a young dairy cow adversely affects her future milk-producing capacity. It is often found that when the first milking season of a young cow is very short, her lactation periods later on also prove to be rather short. Considering the great drain imposed upon the in-calf heifer, owing to her having to carry a calf whilst she is still immature, it is not advisable to put her to the bull again after calving quite as soon as is done in the case of older animals. In her case the time intervening between the arrival of the first and of the second calf should be somewhat longer than the average time, so as to give her time to recuperate. —Exchange.

"Why," asked a governess of her little charge, "do we pray God to give us our daily bread? Why don't we ask for four or five days, or a week?" "Because we want it fresh," replied the ingenious child.

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Butter : Its History and as a Food.

A Lecture by Mr. W. G. Oakey Technical College Bristol.

Little is known of the part which butter played as an article af commerce in ancient times. However, an early historian stated that in the first centuries butter was shipped from India to ports of the Red Sea. In the twelfth century Scandinavian butter was an article of over-sea commerce. The Germans sent ships to Bergen in Norway, and exchanged their cargoes of wine for butter and dried fish. It is interesting to note that the Scandinavian king considered this practice injurious to his people and in 1186 compelled the Germans to withdraw their trade. Towards the end of the thirteenth century, among the enumerated wares of commerce imported from thirty-four countries into Belgium, Norway was the only one sending butter. It may be inferred that butter-making in North and Middle Europe, if not indeed in all Europe, was introduced from Scandinavia. John Houghton, an Englishman, writing on "Dairying" in 1695, speaks of the Irish as rotting their butter by burying it in bogs. His report was confirmed by the discovery in 1817 and later of butter thus buried, packed in firkins. This burying of butter in the peatbogs of Ireland may have been for the purpose of storing against a time of need, or, having no outlet for the article, it kept better thus than in exposure to varying temperatures, or it may have been to hide it from invaders, or to ripen it for the purpose of developing flavour in a manner similar to cheese ripening ; but I think it was found to be the best means of storing it in those primitive days . In my own experience, I can remember Irish butter with a strong peat flavour, and it had remarkable keeping properties, though, of course, it was coarse in flavour. I am now referring to about twenty-five years ago, say, the years 1879 to 1886, when the creamery system in Ireland was in its infancy. The great bulk of butter was then dairy-made, and varied considerably in quality, flavour, condition, etc.—no doubt a time when the retailer was able to make a variety of prices and a better return for him self than in the present day of cut prices ; but more on this subject later. The methods of conducting the butter industry have changed materially during the past twenty-five years. The greatest factor concerned in these changes was the introduction of the centrifugal cream separator, which did much in developing the creamery system. Other factors having a greater or lesser influence which have been brought to bear on the technical side have been physics, chemistry, and bacteriology, thus taking the making of butter out of the commonplace method and putting it upon a scientific basis. As a consequence, butter is not made more economically, but it is of finer quality, and the annual consumption per head has consequently increased enormously, and is still increasing. I pass on to notice butter as a food. Butter is used by all classes of society. Besides being a food and furnishing a considerable source of energy, it may also be used as a special diet for invalids. In cases of exhausting illness which has reduced the body, or where quick growth needs extra nourishing, butter may be substitued for codliver oil, as since it is so easy to assimilate large doses can be taken with impunity. A quarter of a pound of butter can be spread on thin bread and taken easily by nearly everyone needing this kind ol concentrated nourishment. Again, butter is a food product concerning which there need be but little fear in regard to its carrying disease, for fat of any kind is a medium in which few bacteria can develop. Butter is not considered a conveyer of disease to any such extent as milk. Furthermore, butter which is made in an uncleanly manner, or in unsanitary surroundings or from undesirable raw material, will usually make these facts manifest in on way or another by poor quality, usually accompanied by unpleasant odour or taste, butter being such a sensitive product that its taste or smell quickly shows if it has been subjected to unwholesome surroundings. To the average consumer the flavour of butter is one of its most important attributes, and many highly esteemed judges pay little attention to anything but its flavour and aroma, as everyone knows these differ greatly in the different butters. The principal factors in determining flavour and aroma, so far as known, are the development of various organisms of the lactic acid group, the feed, and the period of lactation of the cow. In some cases no doubt the individuality of the cow also plays an important part, such as the Jersey or Alderney and the Devon. So widely, however, has bacteria become recognised as of primary importance in developing butter flavour that many skilful makers depend upon this agency for producing flavour almost at will. In Denmark the practice is almost universal of pasteurising the cream and then using "starters" or cultures of organisms favourable for the purpose. The flavour of butter depends on the character of the milk from which it is made and upon the feed of the cows. If these are favourable, the flavour is mild, sweet, and pleasant, and is desired by many consumers. There are many abnormal flavours which creep into butter in one way or another, and which tend to lower its value for table use. The sources of some of these flavours are well known, while in other cases they are still a subject of much

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speculation. It is not perhaps generally known how sensitive butter is to undesirable odours, not only after it is made, but even before the milk from which it is made is drawn from the cow. One dairyman cites the case in which the abnormal flavour or taint was traced to some calf pens in front of the cows from whose milk this butter was made. The cows, breathing the tainted air, transmitted the undesirable odours to their milk, and thence to the butter, but this I can hardly accept, and think it more likely that the milk was contaminated by the odour after coming from the cow. Some taints come from the volatile oils of food eaten by cows. When these oils are pleasant, as in the case of clover and other foods, the flavour is desirable, but when they come from such vegetables as garlic, onions, cabbages, and turnips, from various weeds, stagnant water, etc., the imparted flavour is most objectionable to most persons, and is intensified according to the length of time the butter is kept. In cases where the butter takes on a fishy flavour after a time, the cause is thought to be a fat-splitting "enzyme," which is in the milk when drawn from the cow, or is produced by organisms in the butter after it is made. Salt which has absorbed disagreeable odours will impart them to butter in which it is used.

The grain, texture, or body of butter is perhaps less understood than any other of its attributes. It is unquestionably of greater importance than is usually conceded, and probably exerts more influence upon the judgment of experts as well as consumers than is generally recognised. The texture of butter should be firm and solid at a temperature of 50 to 60degs. F. Most makers aim to have it firm without being waxy, to the end that when broken the butter may have the fine granular appearance presented by broken steel. There are other makers whose products command the highest price who aim to have their output as waxy as possible. There is a market for both, but it is generally accepted that the waxier butter has the better keeping properties. The body of consistency of butter should always be such that when it is placed on the table it can be easily spread upon bread or other articles of food with which it is usually eaten. Butter is affected in four separate and distinct ways by the addition of salt : — 1. It deepens the colour ; hence it is very important that the salt be equally distributed to maintain uniformity of color. 2. It acts in a slight degree as a preservative by preventing the growth of decomposing bacteria that are always present in fresh butter. 3. Salt has a tendency to make butter drier, but not apparently so. When added to butter in the usual manner each grain of salt attracts to itself enough moisture to dissolve it, thus forming a drop of brine. These drops unite to form larger ones, which are pressed out when the butter is worked. In this way more water is removed from salted butter in the process of making than from unsalted, other things being equal. In this connection it is interesting to note that the moisture in unsalted butter is usually in such a finely divided condition that it cannot be seen, and consequently such butter appears drier than salted butter, which may actually contain much less moisture. It is therefore very difficult to judge the moisture contents of butter by its appearance, either by sight or touch. 4. Salt brings out the flavour of butter in a way that is demanded and required by the different districts in which it is consumed. There is an increasing tendency on the part of the public to demand a mild salted butter.

The ordinary faults of butter can be traced with very few exceptions to the process of manufacture, and not to the animal secreting the milk, or to her food. The faults of butter may be divided into two general classes faults of appearance, and faults of taste and aroma or flavour. One of the serious defects often found in butter is lack of uniformity of colour, or what is commonly known as mottles. This defect is seen in white streaks, spots or patches, which are most pronounced when a lump or package is cut so as show a broad smooth surface. So serious is this defect considered that butter, otherwise perfect, but mottled, is graded as second or third class in the largest markets. The causes to which this fault can be attributed are, first, particles of curd differing in size incorporated in the butter ; and second, an uneven distribution of the salt. Mottles in creamery butter are seldom caused by specks of curd, but in the poorer classes of dairy butter are frequently seen. Most of the mottles found in butter, however, are caused by an unequal distribution of salt. When the wash water is considerably cooler than the butter granules, the exterior of the latter becomes harder than the interior. Tis prevents an equal absorption of the salt when the butter is salted and worked, and mottles result ; and, of course, if under the most favourable conditions the butter is not worked enough to distribute the salt equally, mottles will be noticed in the finished product. Much is heard at times of mouldy butter. This trouble is caused by distinct kinds of mould of various colours, the spores or germs of which are present in tubs or boxes made from improperly seasoned wood, or those which have been kept in damp store rooms. The fault is a serious one, and entails heavy loss on the holder or owner of the butter. This defect has been very frequent of late years, and is mostly prominent in unsalted butter from Canada and the Argentine. When the butter has contained an excess of butter milk, which, rapidly decomposing, causes the article to become, as it were, rotten, it can generally be traced to carelessness in the making, or to unclean surroundings where the butter is made.

The average composition of butter is about as follows, viz. :—Water, 12 per cent. ; fat, 84 per cent. ; casein, albumen, and sugar, 1 per cent. ; salt or mineral matter, 3 per cent. ; equal 100 per cent. Of course, unsalted butter contains but a trace of ash or mineral matter, 3 per cent ; equal 2 per cent. more of moisture than salted butter. The percentage of water is the most variable constituent, but when butter is well made under favourable conditions this seldom exceeds 15 per cent., hence the standard has been fixed in this country at 16 per cent. If butter contains an excessive amount of moisture, it not only deceives the consumers, but will not hold its quality under ordinary conditions. On the other hand, butter which contains a low percentage of moisture (that is, from 6 to 9 per cent.) will not as a rule have a well-developed flavour, and soon becomes tallowy. The highest quality of body and flavour is usually found to carry from 10 to 14 per cent. of water. Physically butter is made up of a great number of minute fat globules, which have moisture adhering to their surface and held between them, and this moisture or water holds in solution casein, sugar and salt. It is estimated that a pound of butter contains from 720 millions to 180,000 millions of fat globules. Because the fat is in such a finely divided condition, it is almost completely digestible, and especially adapted for human food. It is known that water can be worked into butter by various means, which have been employed by unscrupulous persons for trade purposes—a most unfair and degenerating practice ; and a law is urgently required to deal with this immoral trading, a prominent feature and cause of the present cutting of prices and unfair competition to which the grocer

(Continued on page 552).

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Maintaining the Dairy Herd.

— About the Buying of Cows. —

Constant dealers care little about breed or age, whether fat on lean, in calf or empty, as customers can be found for all, with various objects in view; but farmers who are desirous of buying cows to maintain a milk supply must be discriminating and well consider the capabilities of the animal, not only at the time of buying, but also in prospective. It is an unwise and thriftless plan to be always chopping and changing cows. A good herd can hardly result from such a process. The best of judges will be taken in, or fail to detect defects occasionally, and every cow with a good appearance does not justify these on prolonged test; but there are certain points which, as a rule, prove reliable, and these should always be kept in mind and acted on in buying. In looking out for a cow one of the first acts of the inexperienced is to fix on one that, if not actually fat, is in extra good condition, but this is about the last point which judges of good milkers regard. No cow should be thought of that is so thin and out of condition as to suggest the possibility of interior flaws; but then cow with an excellent bag, pliable skin, sleek coat, and clear eye may be thin. There is a saying that a cow cannot both put beef on her back and milk in the pail.

— The Age —

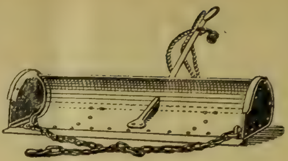
of the cow is another point to which great importance should be attached. One may have cows eight, ten, or even a dozen years old in their herd which were bought when young, or bred on the place, and have been such a success as to warrant their being retained so long, but to buy a cow over five or six years old, and put her on the permanent staff, is getting far too near her time of depreciation. A promising heifer newly calved, or about to calve, is a more desirable beast than the finest of cows past their best, and declining. A cow with her second, or at most, third calf is the most desirable of all, and this is undoubtedly the most profitable age to milk them. As milkers and breeders they have all their best days in front of them, and with sufficient time to pay handsomely. There are plenty of trustworthy men you can buy from who will tell you the right age, and it is well to shun sellers who try to take one in respecting age and other conditions. Young and old cows are very distinct in appearance. The former have an unmistakable appearance of fulness of flesh and coat, while the old ones are more or less shrunk. The teeth give an indication of age, and the horns are often looked to as a guide, the young having smooth horns, and the aged wrinkled; but the projecting rings have been known to be removed, and the horns made smooth by scraping. Any signs of this should be treated with suspicion. If pure breeds are bought typical animals, in size, form and colour should be secured. If crosses are bought, get them with the greatest tendency towards the best breed the cross has been secured from. Cows with a male or bull type of head are rarely good milkers. The head should be refined, neck thin, forequarters slim, hindquarters wide, square, and robust, with deep, broad shoulders.

— The Bag or Udder. —

is always the first point to take the eye and be considered. A capacious udder is a great recommendation, but its condition should always be examined. First try the teats. Never buy a cow without first doing this. If the milk cannot be drawn from each in a full flow have nothing to do with it, as an impediment may soon become a blind teat, and that is a great deficiency and deterioration. Almost every cow that is taken to market while in milk is treated to represent a bag which is not of the everyday kind. They are not milked for twenty-four or thirty-six hours before being put in the market. If there is a calf with them this is muzzled to prevent sucking or emptying the bag, and the latter is distended to its utmost, or, indeed, beyond it, as the milk often runs out freely. This is a very common practice, especially amongst dealers. A thick, fleshy udder, is objectionable. It should be firmly attached to the body, the bottom nearly level, and extending well forward. Some udders are almost as full looking after milking as before. These are the fleshy ones, but those composed of soft, wrinkled, pliable skin after milking are the best types. The unskilled will get on best if they

— Buy When in Milk, —

as then the udder can be judged and the teats tried. When the cow is dry the udder and teats are generally so shrunk that little or nothing can be made of them, al-



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though blind teats are always smaller than those in working order, even when there is no milk being given. A giver of abundance of milk is of course the main consideration, but apart from a good udder some find objection with the teats. Very small ones—of which the Ayrshire has, perhaps, the most miniature—are much objected to by hurried milkers, but it is greatly a question of practice, and many will milk a small-teated cow as fast, and get as much milk, as 'from those with large ones. Doubts and difficulties of buying may be greatly reduced by 'all breeding and rearing a considerable portion of their own herds. —Farmer, and Grazier.

Salt for Cows.

Some experiments conducted by Professor Babcock—the inventor of the milk-tester—in Winsconsin regarding the giving and withholding of salt to cows, are of interest to dairy farmers. He found that if salt were absolutely withheld the effect would be seen with some cows in from two to three weeks, but some individuals went on for the most part of a year without any evil effects, but sooner or later the animal developed a state of low vitality, ending in a sudden and complete break.down, though recovery would be rapid when salt was again given. The effect was worst shown at calving time, or immediately after. In general cows giving the largest amount of milk were the first to show signs of distress, while there was less trouble when the animals were on the pasture than when in the cowshed. Dry cows suffered very little, and the same applies to bullocks 'and store cattle—the salt naturally in the food, or in the "earthlicks" of animals out in the fields being nearly sufficient for them. In an ordinary daily ration there is about three-quarters of an ounce of salt, and this is nearly, but not quite, sufficient for dry stock per head, but not enough for a milk cow. The milk drains away a lot of salt out of the system, and an additional ounce per head daily must be added to the food of a cow indoors. Many years ago the French Government carried out some experiments to test the amount of salt required by the different kinds of farm stock, and reckoned a milk cow required a total of two ounces daily, and this corresponds with Babcock's figures allowing for differences in the size of different breeds. It is therefore safe to say that a milk cow requires about an ounce of salt daily when in milk, besides what she gets in her food. When out of doors the best way is to let her have access to rock salt to lick, but, indoors it must be given in the food in the ordinary granular form.

Altering Pigs.

"The fact that so many pigs succumb to the operation of castration, or suffer from tumours forming in the scrotum after removal of the testicles, is largely due to carelessness and ignorance," says Dr. A. S. Alexander. It is a very easy matter to castrate a young pig, but just as easy to do it wrong. In our experience most of the trouble comes from the use of dirty instruments and rough handling. The knife that is used for tobacco cutting, and is specially sharpened when the time comes to castrate pigs, is apt to cause infection. It may be a suitable knife otherwise, but is dirty, and should be thoroughly cleansed before using. Boiling will suffice if that can be done, which is seldom the case. It is, therefore, best to immerse it in a strong disinfectant before use, and after operating upon each pig.

The hands should be cleansed with a similar solution, and it is well to use it also upon the parts to be operated upon. As it is, pigs are often taken from a filthy pen and castrated without preliminary washing, and no provision is made to have them occupy a clean, disinfected, and freshly-bedded pen after the work has been done. Pigs should be taken from a clean pen, or washed before operating, and afterwards should go on to a clean pasture-field or into a pen that has been specially prepared by scrubbing, disinfection, and whitewashing.

The next point is to make free incisions in the scrotum. Where small cuts are made, the wounds close too soon, and retain blood or pus, and there is also the liability of the cords to become caught between the healing lips of the scrotal wounds, which will surely be followed by the formation of tumours such as we have alluded to. The cords should be severed high, and where this is done and the scrotal wounds are large, there is little danger of tumor formation. Rough handling, and especially dragging upon the cords, increases the liability to tumour, and also to ruptures. When a pig is found ruptured in the scrotum at castration time it should be left uncut or castrated by the "covered" method. This consists of cutting through the skin of the scrotum alone, and then enclosing testicles and their develops on clamps which will cause the parts to slough off and leave the sac healed, so that the intestine cannot descend. The same end may be achieved by stitching the envelopes skilfully.—"New Zealand Farmer, Stock and Station Journal."

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(Continued from page 549).

is subjected at the present day. Our laws concerning adulteration of butter are not drastic enough. We should take a lesson from the United States of America, where butter is deemed adulterated when it contains more than 16 per cent. of moisture, any foreign matter or any chemical or other substance used for the purpose of removing rancidity or of cheapening the product, consequently the article known as milk-blended butter would not be tolerated in that country. Martiny, an eminent German dairy authority, compilled the percentage of moisture in 17,332 samples of butter from analyses in various countries, and found the average to be 13.55 per cent., so that the 16 per cent. limit is a fair one, and where water or moisture is found in excess of this legal allowance it is incorporated during the process of manufacture or afterwards for the purpose of adding to its weight.

The care of butter is worthy of the best consideration and attention of all who handle this important food. A small quantity of butter cut from a large package and left exposed will soon lose its freshness, hence butter should be kept in bulk as much as possible, and in a cool, even temperature, and when exposed for sale should be kept separate from articles of any appreciable odour. And here, I think, is one of the reasons that the butter shop has been so successful, more attention being paid to the surroundings of the article. Being freed from the pungent odours of soap, coffee, and other articles which are comprised in a grocer's business, the butter is distributed to the consumer in a fresher and more perfect condition. Still, this is a matter that can generally be remedied by attention and thought, and with marble slabs and tiled backs to the butter shelves the article may be kept and sent out in perfect condition. Again the use of best grease proof should be strictly adhered to in wrapping butter, as common paper carries with it and imparts to the butter an unpleasant flavour.

Clean Food for Pigs.

The pig possesses certain habits which are apt to create the impression that he is a lover of filth, and while it is true that he possesses a few cleanly habits, yet, after all, in this matter other farm animals are more circumspect in their mode of living.

The pig's short neck makes it almost compulsory for him to partly climb into his trough at feeding time, and if attention is not paid to keeping the feeding ground clean there will be considerable filth devoured. While a pig will devour more dirt than any other farm animal, yet his system is by no means designed to handle these economically and successful breeders generally take great pains to feed pure food.

One common mistake in feeding pigs is to use refuse from the kitchen that is not only worthless as a food, but decidedly injurious to the digestive system. We have observed cases where all forms of dishwater were carefully reserved for the porkers, and in this semi-liquid, semi-solid conglomeration there is generally considerable soapsuds.

Now, soap is an excellent thing in its proper place, but as an aid to digestion it is a decided failure. Indeed, it is decidedly injurious, and we have known many instances where pigs were thrown out of condition and stunted in their growth by its use. Next in the list of injurious substances to soapy water or swill, as it is generally called, is that of supplying muddy drinking water. We fully appreciate the fact that where running water is not available one of the most difficult tasks before the stockman is that of supplying his pigs with fresh, clean water during the summer. Their nature is such that they simply will persist in taking possession of their drinking fountain with their dirty bodies, or if there is not room for the whole body, they will be there with all fours. We have found that a good drinking fountain with a surface just large enough to get their noses in, is about the best piece of apparatus that can be used. If these are attached to barrels or tanks, and a supply of cinders or gravel placed around it, so as to prevent a mudhole from forming, one may have reasonable success in supplying pigs with clean water.

Where the old-fashioned V-shaped trough is used, the top should be well latticed so that the pigs cannot wallow in it; and even then the latticework should be constructed so as to be easily removed, in order to facilitate a thorough cleansing at least once a week. Filth in the water-trough will, in our opinion, weaken the digestive system of the animal, and render him a prey to disease quicker than any other one thing.

A Run at Grass.

A run at grass during the course of the summer is often of great benefit to horses of all descriptions. When a horse shows signs of staleness owing to continued and severe work and a diet of dry food, nothing will do him more good than a nice long run at grass. There can be no question that many horses would remain servicable and last much longer than they actually do, if they were occasionally turned out to pasture and given a rest for two or three months. But if a horse cannot be spared out of the stable for as long a time as this, even a four weeks' run out at grass will do him much good.

It frequently happens that stabled horses cease to do well, are off their food, and loose their bloom without any apparent reason. They appea-

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dull and feverish, and do not perform their work as briskly as they usually do. A dose of physic and a course of bran mashes may sometimes put matters right under these circumstances, but these measures do not always prove satisfactory, and often have only a temporary effect. The best thing, and frequently the only successful remedy, is to turn such horses off for a time, and to give them a complete rest.

BEST RESTORATIVE FOR LEGS

A run at grass on a nice soft and spongy pasture is the best restorative for legs that have become worn and are puffy as the result of work on hard ground. As soon as it noticed that a horse's legs are beginning to get worn or the animal is losing his customary freedom of action, and moves in a stiff or cramped manner, there is no better plan than to turn such horse out to grass The legs then get a good rest, and can recover their tone, so that they will probably be all right again in a short time; and when the animal is taken up again later on the legs will be quite clean and fine. By giving a horse a timely run at grass, when it is noticed that his legs require a rest from work, permanent blemishes, such as windgalls, thorough-pins, and bog spavins, or actual unsoundness, can often be prevented from occurring. Too often, however, owners neglect to give their animals a good rest until it is too late, and when no amount of rest out at grass will be able to restore the worn legs to their original state of cleanness and fineness. The thing is to turn out the horse just before his legs go wrong, and not to wait until the mischief has been done. It is well to bear in mind the old proverb, "A stitch in time saves nine" in regard to this question.

BLISTERING BEFORE TURNING OUT.

The practice of blistering the legs before turning a horse out is a very common one, says "Kisber" in "Farmer and Stockbreeder," but in many cases the use of a blister is quite unwarranted. If the legs are actually sound, and merely a bit worn and puffy, the application of a blister cannot do any good, and should not be resorted to. The supposed benefits accruing through blistering the legs are in many cases not due to the blister at all, but to the prolonged rest the horse enjoys when turned off after being blistered. It certainly is a better policy to give a horse a run at grass before his legs get so bad as to require blistering rather than to postpone the rest and trust to a blister to put matters right again. The beneficial effects of blistering are certainly overrated.

If an animal is turned out chiefly on account of the state of his legs, it is, of course, necessary to put him in a pasture with really soft or spongy soil. If the ground is very hard and baked, the legs will not experience much benefit from the rest.

The hoofs are greatly benefited when a horse is turned out for a prolonged period of time, because of the large amount of pressure that falls on the frogs when horses go barefoot, as they do, or ought to do, when at grass. This pressure induces the frog to get larger, and thus expands the hinder portion of the foot, supposing the latter has not become so contracted by bad shoeing that all chances of it again expanding have gone. Cases of thrush in the frog are very generally cured when horses are turned out, simply because of the healthy pressure which the frogs are subjected to. Even bad cases of this complaint heal without any trouble when a horse is at grass, though it is advisable to apply plenty of Stockholm tar to the cleft of the frog before turning the horse off, and, if deemed necessary, repeating the applications after two or three weeks.

HORSE'S CONDITION.

A great drawback connected with a run at grass is the fact that a horse loses his hard working condition, and gets soft and more or less pot-bellied when turned out. This, of course, necessitates his being got into working condition again very gradually when taken up, and when he first comes into the stable again his working powers are but very limited, while his wind is none of the best. The loss of hard condition and the acquisition of a big or "grass" belly can in some measure be obviated by feeding some oats while the horse is at grass. An allowance of from 2lb. to 4lb. daily can be fed, according to the quantity deemed necessary. By giving the oats the firmness of the muscles is retained, and the animal does not develop a very big belly, because he consumes less grass when in receipt of an allowance of oats. In cases, however, where horses suffer from great staleness, and when their legs are filled or have been blistered in consequence of sprain or some other injury, it is best to dispense with any corn—at any rate, during the first part of the animal's run at grass, since the system requires thorough cooling, which can only be obtained by an exclusive diet on green food.

REST

A rest at grass on a soft pasture is especially beneficial to young horses under six years of age. Until six years old horses require considerable management as regards the amount and nature of their work, because they are yet not in their prime; therefore animals under six years of age are much more liable to suffer from the effects of continued and severe work than an immature animal, and all horses under six pears ought to be looked upon as not fully matured. This point is frequently disregarded, and four and five-year-olds are expected to do the same amount of work demanded from older horses. As a result of this, many promising and valuable horses are prematurely worn out and rendered unsound at a comparatively early age. It certainly is very advisable to give young horses an annual rest at grass whenever it can be arranged.

The two chief desiderata in a pasture where horses are turned out are plenty of shade and plenty of water, whilst it is also essential that the ground should be soft, or, at any rate, not too hard.

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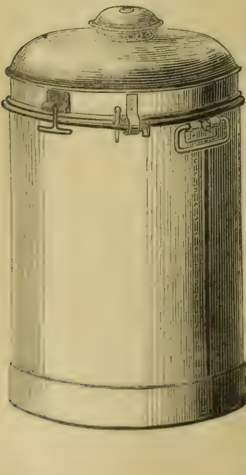
Breaking-In Young Cart Horses.

Young cart horses are generally broken to the collar when old enough. It is highly injudicious to attempt to break them in any earlier, for until they have attained the age of two and a half years they are still too immature and too deficient in strength to be fit for performing even the lightest kind of farm work without suffering undue strain. And even at two and a half years old a young cart horse is really ready for breaking in only provided it is well grown and in a nicely forward condition. If a colt or filly is at all backward or deficient in growth at that age it is decidedly advisable to give the animal a little more time for making further development and improvement ere taking it up for the purpose of breaking it in. Nothing is lost by postponing the breaking-in process to a somewhat later age, whereas to put a young horse to work before it is really sufficiently developed and has gained adequate strength can only do it harm and may easily ruin its future usefulness by permanently weakening its constitution, or lay the seeds of some form or other of unsoundness through its immature frame being over-strained.

In breaking in young cart horses it should be remembered that they are still at a comparatively tender age; that their strength is as yet quite undeveloped; and that, on account of their immaturity, they are not able to stand much strain. Any undue exertion is liable to entail injurious effects. Consequently they require to be treated with the utmost consideration, and care must be taken to avoid overtaxing their powers in any way, either by working them for too long hours or by putting them to too hard work. They must be inured to work in the most gradual manner, and until they become somewhat seasoned they must be spared all severe exertion. The principal object at first is—or, at any rate, should be—merely to accustom the young animal to the collar and to performing draught work, rather than to get any real work out of it. One should not be in any hurry to make the colt or filly actually earn its keep.

It is strongly to be recommended that young cart horses be given a daily allowance of corn for some little while before they are actually brought into the stable in order to be broken in. This corning serves to improve their condition and to increase their strength very materially, thus rendering them more fit for the task which lies before them. Needless to say, young horses require to be brought on to a corn diet in a gradual manner, so as to avoid the danger of digestive disturbances, which so readily result when a young horse, which has hitherto subsisted only on grass, is suddenly given much corn. It is undoubtedly by far the best plan to accustom the young cart horse to being corned before it is actually taken up, as apart from the fact that corning improve its condition, it can then be brought on to a full ration of oats straight away as soon as the breaking-in process is commenced. And at this stage young cart horses certainly stand in great need of a liberal allowance of corn, since the ordeal of being broken to the collar takes a lot out of them and tells greatly on their strength, for although the work which they are called upon to perform may at first be very light and easy yet to the green and immature colt, wholly unaccustomed to being worked and in utterly solt condition, without muscle or strength it means a great deal of exertion. Moreover, full feeds of corn are required in order to get the young horse into some sort of working condition as soon as possible and be it remembered that its strength not only needs maintaining, but must be increased, which can only be done by good feeding. Corn is the only kind of food that will put hard muscle on young horses, and the development of their muscular powers is wholly dependant upon their being given plenty of oats.

Previous to the young cart horse being actually yoked, it is advisable to give the animal a few preliminary lessons in wearing the collar, harness, and bridle, so that it may be thoroughly accustomed to these before it is taught to pull. That will greatly facilitate matters and save a good deal of trouble, since there is nothing like teaching a raw young horse what it has to learn step by step, so as to avoid bewildering and upsetting it which always happens when one tries to teach the young animal everything at once. By letting the colt wear the harness and bridle for a few hours whilst standing in the stable, and repeating this lesson a few times, it will readily become familiar. It is most important to see that the collar fits the young horse properly, there being nothing which is more apt to give rise to trouble in the breaking-in of young cart horses than an ill-fitting collar, for this causes much discomfort to the animal, if it does not actually hurt it, and it is most liable to chafe the shoulders, the skin of which in raw young horses is always more or less tender and easily chafed. If the collar hurts, or has caused the shoulders to become sore, the young horse will not go into it properly, but flinches and hangs back, and very likely may refuse to pull altogether, much trouble thus being caused. An ill-fitting collar often renders a young horse



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collar-shy, a trouble which it takes a long time to overcome when once it is allowed to occur. In order to avoid the risk of the shoulders getting sore when young cart horses are being broken in, which is rather liable to occur at first owing to the tenderness of the skin, it is a good plan to bathe the parts against which the collar presses with a solution of salt and water, or—which is even better—alum and water, this procedure being continued for a few days. This tends to harden the skin very effectually. For the first week or so, the collar ought not to be taken off immediately after the young horse returns to the stable, but it should be left on until about an hour afterwards, as this serves very greatly to lesson the danger of the shoulders being wrung or becomeing sore.

Young cart horses do not stand in need of any special mouthing when they are being broken to the collar if they are kept bridled and bitted for a few times whilst standing in the stable pservious to being yoked. This will quickly get them used to having a bit in their mouth, and that is all that is required. They will soon enough learn to follow the indications given by means of the bit in the ordinary course of things; and as, moreover, the cart horses on farms are so largely guided by the voice in their work there is no call to trouble much about forming their mouth.

When they are first put to work, young cart horses cannot be worked too lightly, and they should be allowed to take things easilyf One should carefully avoid tiring them too much for apart from the physical harm which that nay do them, the fact of their being tired out disgusts them with their work, and may have a bad effect upon their willingness to work in the future. As they gain strength and put on muscle, the hours of work may gradually extended, but in no circumstances should a moderate limit be exceeded. The young and immature cart horse should be saved in every way, and it is advisable to let it have a complete day's rest at frequent intervals until its working powers are well developed.—Live Stock Journal.

Tuberculosis.

Of all the diseases which the medical profession have attempted to accuse milk of producing, none has had such an unenviable notoriety as tuberculosis. Indeed, one might believe that if it were not for the foolish custom of drinking milk, consumption would not be known. Never have more astounding statements, based upon uncertain facts, been made by those professing to have a scientific training, than in connection with this subject. All the evidence procurable goes to show that cows suffer from tuberculosis of the udder very rarely. Many of the older statements as to the frequent presence of tubercle bacilli in milk are now known to be wrong, and of acid-resisting organisms, which were then supposed to be necessarily tubercle bacilli. But it is now proved that 'many of these acid-resisting bacteria are merely grass organisms. It has not even been proved that tubercular disease of cows is communicable to man. Lastly, it seems to be universally forgotten that if the tubercle bacilli are present in milk they pass directly into the digestive organs, and not into the respiratory organs, yet it is certain that consumption in the digestive organs is comparatively rare, the disease being mainly confined to the respiratory organs.—Exchange.

Shelter Belts for Stock.

Every Australian breeder should recognise them as an absolute necessity, in the hot weather, when they afford cattle a harbour of refuge from the heat, and to a certain extent from the torture caused by troublesome flies.

There are other aspects as well in which shelter belts are beneficial. According to a bulletin issued by the United States Government, they are invaluable in protecting crops from the damage frequently resulting from the full force of hot destructive winds. They also help to conserve the moisture so essential to crops growing in a climate like ours. It has been proved that wind is a great help to evaporation; as its velocity increases evaporation is rapidly augmented. Shelter belts in breaking the wind effectively retard evaporation, and thereby save to growing crops the soil moisture necessary to keep them thrilty during dry windy times. These facts are especially pertinent in a treeless, level agricultural country, where the wind has an unobstructed sweep for milws, and gets constantly drier in its course.

cf tree planting is done judiciously in districts where natural timbers are scarce, there is the further advantage of having the necessary timber needed on the farm at hand. The various uses of the shelter belts will go hand, and in hand will materially improve the value ol the land and the comfort of the farmer and his stock.

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The Art of Showing a Horse.

The art of showing a horse so that he will exhibit his good points in the highest degree of prefection can only be adequately performed after years of practice. But practice alone is not enough. It is necessary to have a quick eye; in fact, the man to reach the top of the tree in this particular direction must be a born judge. It is often a matter of comment in the show-yard how so-and-so's horses are always brought out on the top of their form, and how conversely good animals are frequently spoilt in other studs because the art of showing them is not properly understood. It may be laid down as a primary rule that a horse should only be shown when he is fit. How frequently do we see cases where animals of undoubtedly superior merit have been put back in the prize-list because it was their day off! There may, of course, be various reasons for this, and there is no more fertile cause than over showing. The manner in which an expert showman will bring out a horse deserves to be recognised more as an art than a business. No two animals can be treated exactly alike, and it is this fact which gives the successful judge an opportunity of scoring over another, who may be sufficiently expert in the mechanical art but cannot apply it in the same way. It is not merely a question of getting sufficient flesh without too much fat, the maintenance of the hair in a heavy horse, or the condition of the legs in a light horse, but the mouthing and training are two particular points in which the adept scores so successfully.

We have known cases of physical defects being immensely improved by the art of the showman; for instance, even in the matter of shoeing a great alteration can be made in the action of the horse. The use of heavy shoes and light shoes is better understood by harness men then by any other class of exhibitor, and very frequently judges themselves are deceived, in so far as they ascribe an effect to a wrong cause.

While there is undoubtedly a great art in the showing of harness stock, it is sometimes much more difficult to conceal the defects of action in an animal shown in hand. Some horses show themselves much better when untrammelled with bridle and line, and some good judges contend that the art of showing a horse should consist in allowing the horse to show himself. Not infrequently one witnesses the spectacle of a showman receiving advice from the ringside with reference to the showing of a hackney horse in hand, but however capable of giving advice that important body of public opinion may be, it should not be forgotten that some horses go best at certain paces, and that pace can best be regulated by the man who is showing. This is particularly the case in a hackney horse, which is inclined to fight somewhat in the fore-action. To give him rope would merely accentuate this defect, and not infrequently by giving him a somewhat shorter line the action can be heightened, and the hock action greatly improved. In the case of the draught horse the exhibitor has more opportunity to mask defects than in the case of a light horse. A little back at the knee—a tuft of hair can conveniently mask what would otherwise be a defect; and in the joints, too, much can be done by an expert showman to make the most of such joints as a horse is furnished with by the skilled use of wet bandages. How often do we hear the remark passed that such an animal has not natural but "made" joints, a tribute in a sense to the skill of the showman, although, of course, it does not entirely deceive good judges? Yet it cannot be reasonably taken objection to, because a man is entitled to show his horse in the best possible fashion, so long as he does not stoop to methods which are intended radically to deceive in a shady manner. It is a well-accepted maxim that foals show themselves to more advantage when run loose than when shown in hand, and a great many yearlings and young stock never quite do themselves justice at that age because their training is not quite matured.

Similarly, in the showing of hunters a tail-coat is of no inconsiderable service, and not the least successful move of the professional shower is to understand the pace at which his horse shows to best advantage, and in this respect it may be mentioned that relatively less attention is paid to how a horse may hack, compared with the attention devoted to him when extended. Altogether, the showing of horses illustrates almost more than anything else how success lies in putting the finishing touches. Most exhibitors are good up to a certain point in the mere mechanical bringing out and dressing, but the art really lies in studying the horse from all points—his pace, his action, and his temperament—and making the most of them.

Diseases of Sheep.

— By H. Leeney, M.R.C.V.S. —

Sheepbreeders in general probably give but little credit to the veterinary profession for recent improvements in the treatment of ovine diseases. A great deal that has been written might be summed up in the caustic words of a reviewer, who said of a book, 'It contains much that is new, and much that is true, and that which is new is not true, and that which is true is not new.' The sheepbreeder is like others, inasmuch as he does not like being preached at, and the attitude of the breeder is, truth to tell, the correct one for the veterinarian; since nearly all the breeders' troubles are the outcome of climatic or dietetic conditions, which the doctor cannot cure, but follows the now universal practice of preventive medicine, in pressing upon clients the desirability in avoiding first causes, or anticipating the consequences of adverse conditions, which latter may be unavoidable. The diseases of sheep are most mysterious; they are all pretty well understood—their means of communication, their progress, duration, and sequelae; but the nature of the animal, the conditions under which he must live to be worth keeping, are such as do not lend themselves to individual doctoring, such as the horse or dog. The maladies of the sheep, whether in Australia, in the Argentine, or in the homeland, are much the same, except that in this matter, as in so many others, Australia suffers less.

— Parasitic Host. —

A considerable army of scientists are engaged in all civilised countries in investigating the diseases of animals, and from the Bureau of Agriculture of the United States, and from the New Zealand experts employed by the Government, we continue to receive valuable reports, all pointing in the

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direction of good management as a means of prevention of disease, and with but little in the way of recommendations for the treatment of it when established. It is only when some specially favourable season develops immense numbers of parasites that the sheep owners can be prevailed upon to wage a war which should be perpetual. If the parasitic diseases were eliminated the sheep would know but little trouble. If united and determined, unrelenting effort were made, we could reduce them almost to nil. It is too often forgotten that the determining causes of parasitism are not simply environmental, but constitutional, and more or less interdependent. It is not to be supposed that because a lamb is weakly in constitution he will actually develop, say, bronchial worms without the seed. It is an old theory, long since exploded, that dirt and poverty "breed" certain maladies they do so in a broad sense, but there must be the seed, or nothing in the animal or vegetable creation can be reproduced, unless it yield "seed after his kind, whose seed is in itself upon the earth." After muddling about for centuries, and thinking ourselves too clever to accept the above simple declaration, we have had to come to it after all, and our scientific leaders are now agreed that "it was so." Before a sheep can become the host of a parasite it must in some form have been present in the water or pasture, which latter includes the air as a medium for winged creatures. Butchers, and all who have had to do with the dressing of carcases, will testify to the constant or nearly constant presence of some form of parasitic life in sheep, and because the majority "die well" and appear to have suffered no ill effects, a familiarity breeds contempt for this danger, as for other risks. It is doubtless a part of nature's economy that sheep should carry certain guests, and that no great harm results, so long as fair balance is maintained, but for reasons at one time regarded as inscrutable, but now pretty well known, there is a veritable invasion at irregularly recurring intervals, and the breeder scores a loss where he should have made profit. It is not enough that we should strive against these pests when by their numbers we see serious damage in front of us; we should endeavour to get rid of the seed. The few mature worms of this year are capable of spreading disaster next year, since "the vilest things do fastest propagate."

Favourable Conditions for Certain Worms. —

The most favourable condition for certain classes of worms is the stagnant pool, with low forms of vegetable life in it. It circumstances permit, then, we shall not water the flock from such sources. One of the chief reasons for the greater losses sustained by Australian sheepbreeders is due to the necessity of drinking from water holes polluted during the long droughts—polluted by the sheep themselves as well as other creatures.

Constitutional vigor on the part of the animal seems to confer more or less immunity from attack, and the power of resistance when attacked. On swamps, for instance, where wethers will live fairly well, lambs or hoggets will fade away, the victims of parasites which they cannot throw off. Older animals will succumb when poor. There is what is known as physiological degeneration, and such condition invites invasion. In the healthy and vigorous the blood contains more iron and salt, both of which are inimical to many forms of parasites. Our fore-fathers discovered the utility of these two substances before they had analysed the blood, and they are recommended in the oldest works extant as a "cure" for this that, and the other, having its origin in parasitism.

The long-woolled and heavy breeds suffer most from parasitic invasion, not alone because they are reared upon lowlands which suit the generation of worms, but because they have to grow wool as well as make growth at the same time. This has been noted in New Zealand especially by that eminent veterinary adviser to the Government, Mr. J. A. Gilruth, M.R.C.V.S.

With regard to drugs, recent experiments performed by Mr. Gilruth in New Zealand would seriously shake our faith in their vermicide action, were it not that experience at home has shown that a course of medicine, of which even large single doses produce no appreciable effect, have, after a time, a marked influence upon the subjects to which they are administered. Going away from sheep for illustration of my meaning, I would point to the use of so-called "alternatives" for horses and cattle. Not Finlay Dunn, with his lifelong study of veterinary therapeutics, could tell us how they act, but agrees with other observers that "they alter for the better the condition of the system," and that they "counteract or annihilate disease, though their modus operandi is not yet definitely settled." So it is with worm remedies, or at least some of them, with sheep. Although living worms taken from the sheep and immersed in these substances in about the same amount of fluid as would be found in the living subject do not quickly die or seem much to mind their position, it is known by experience that a course of such substances as iron and salt has the effect of rendering the host undesirable as a dwelling, while the absorption of the drugs into the system of the sheep provides the blood with materials in which it was deficient, and so adds to the vigor of the animal, and enables it to overcome the debilitating influence of parasites.

The proportion of powdered sulphate of iron to dried salt should be that of one of the former in a hundred of the latter, more concentrated doses inducing constipation in ordinary seasons, but permissible in wet weather, and on scouring pastures.

The Dairy Man.

A lot has been written about the dairy cow from all points of view. We have studied her various requirements, and offered advice in abundance on the best methods calculated to improve her milk yielding capacity in order to bring about more profitable results. While this is as it ought to be, we have come to the conclusion that it is equally essential to study the dairyman. A dairy expert recently said:—"It is necessary that both should be of the right type to ensure success. One can accomplish nothing without the other. Good dairy cows will bring no profit unless handled by a good dairyman; and a good dairyman can make no profit unless he has good dairy cows."

We do not go so far as to say that the man must be bred right as well as the cow, but he must have a good deal of natural adaptability for the business. Some men keep dairy cows, yet dislike them, and their surroundings, and the never ending work and attention which they entail. If in a position to do it, they delegate their duties to the hired man or boy, and chance the consequences. Such men rarely succeed with their cows. We have known some of them, first.class farmers in many respects, yet fail where the dairy cow was concerned. They did not like cows, and the cows did not like them.

"What makes the lamb love Mary so?
The eager children cried.
Why, Mary loves the lamb, you know,
The teacher she replied."

While farming is a staple business all the world over, there is no branch of it that brings in quicker and surer returns than dairying to the man by nature adapted to it. He must be a man who likes his cows, takes a pride in them, studies their wants, does everything possible to assure their comfort. If he likes his business it makes him a happy man.

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Raising Calves Without Milk.

Farmers and dairymen must use good bulls, raise the heifer calves, develop the young heifers, and give the best of care and feed to the resulting cows. But he who sells the whole of his milk has none with which to raise the calves. But to raise calves without milk is quite a difficult task (says a writer in The American Agriculturist). During the first three weeks of the calf's life it is quite impossible. But after this short period of time undoubtedly excellent calves can be reared without any milk at all.

The newly-born calf should be allowed to remain with the mother for the first two or three days . It is thus enabled to obtain the colostrum (or first milk) which is so essential in starting the work of the digestive apparatus. This is of advantage to the mother also, because the nursing of the youngster tends to relieve the inflammation which is invariably present in the udder to a greater or less degree at freshening time.

For two weeks following the time when the calf is taken from the cow it should be fed twice daily from a clean pail about 5 lb. of whole milk fresh from the cow. This is not a great amount, but is enough to make the calf grow well, and to remain just a trifle hungry, so that at an early age it begins looking for some other source of supply. In most cases when between two and three months old the calf will begin nibbling at bits of hay or straw lying about. This is a good indication that a great deal of nourishment would be taken— lucerne or lucerne hay— or some grain if the youngster had access to it. A mixture of cracked corn, whole oats, bran, and oilmeal in equal parts, supplemented by lucerne and a small amount of corn silage, makes an excellent ration for young and growing calves.

But the calf is yet too young to rely wholly upon dry, solid feeds for sustenance, and some nourishment in liquid form must be furnished for a time in addition to the small amount of solid food he will consume. For this purpose oilmeal mixed up in form of a gruel is much liked by calves starting with a smaller amount and increasing to 1 lb. of oilmeat daily per calf, mixed up in hot water, and allowed to cool to about 80 degrees. There are many commercial calf foods on the market, but these, as a rule, are high in price.

One of the most remarkable methods of raising calves without milk was that advocated years ago by Stewart in "Feeding Animals." Stewart's theory was to boil hay that had been cut early, thus extracting the soluble nutritive constituents. "The extract contains all the food elements required to grow the animal, besides being as digestible as milk." Usually the hay tea in itself contains too small an amount of nourishment and too much water. To overcome this objection Stewart added middlings and flax seed, and referring to an experiment in rearing calves with hay tea he says: "We tried an experiment by feeding two gallons of hay tea in which one-fourth of a pound of flax seed and one-fourth of a pound of wheat middlings had been boiled, to each of five calves thirty days old. This experiment was continued sixty days, with a gradual increase during the last 30 days of middlings to one pound per day. These calves did remarkably well, gaining an average of a little over two pounds per head per day."

Two pounds gain daily is large for calves, and really more than can reasonably be expected from the feeding of skim milk, and the ration of hay tea, middlings, and flax-seed meal is so cheap and so easy to make that when it becomes generally realised that good results can be obtained through its use, the dairyman will have solved well the problem of supplying cows to the dairy that are each generation better and more productive than those of the preceding generation. Then will dairy-cow improvement begin for sure, and we will cease to be content with cows of the common low grade that are being milked to-day.

Ensilage Compared With Hay.

It must not be surmised that the main object of coverting into silage the green, succulent grass and fodder, which is so plentiful in all parts of the State during the spring of the year, is because there is any risk of its being spoiled by bad weather if made into hay. It is because by practical experience it has been shown that by ensiling a crop much more of the nutriment is preserved than if dried into hay, and that a given acreage will carry more stock; also by converting it into succulent silage the crop is available for purposes for which hay by itself would not be suitable, viz., for milk-producing or fattening stock, without going to the expense and trouble of growing root crops to mix with the hay, to make the equivalent nutritive ratio. The advantages to be gained by the use of silage has been proved wherever used ,and it is within the means of every industrious dairy farmer to have a quantity of green fodder all the year round in the form of silage. The most suitable time to cut for silage is when the fodder has reached its highest state of maturity, and before there is any chance of its entering into the ripening stage. The overhead silo is now to be seen in most dairying centres of the State, but as this is beyond the means of large numbers of dairy farmers at the present time, it is necessasy for them to know that holes any shape, simply dug in the ground where you can depend on the earth being sound, may be used with the greatest success From my own knowledge, good silage can be produced by putting into the pit the green fodder, chaffed or loose, and simply covering it with two feet of earth ; in six or nine months' time it will come out succulent and sweet. All kinds of wheat and thistles, if pitted whilst green and succulent, have been turned out six months afterwards in excellent condition, and during the cold winter months stock have devoured them ravenously. By saving the green fodder by this system, thirty to forty tons can be silaged off one acre, thereby allowing a dairyman with a little land to keep a large number of stock, and at one-half the cost of other foods. I have known animals to fatten as well on silage as they would on the best of spring pastures. Another important factor is this, that the greater the number of animals you can keep on a small farm, the more manure you can save, and thus be in a position to put back into your land what the crop has taken out, and thereby keep up the fertility of the farm, and enhance its value at the same time.—Journal of Agriculture.

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Hints on Small Wool Clips.

At the present time sheep are depasturing on a larger percentage of the small holdings in South Australia than ever been the case before. Practically all this wool is sold in the local market. Unfortunately, however, for the farmer, this wool sometimes does not come to market in very good order, and buyers view these carelessly got up clips with a certain amount of disfavor almost amounting to prejudice.

In this article we wish to point out as far as possible the faults in general character and get up, which, if remedied, would mean a source of profit to the grower.

It may be taken for granted that the better a clip is prepared for market the greater the competition, and, naturally, the higher the price per lb. secured. Many a clip is spoilt by the want of attention at shearing-time, and if proper attention is not given to skirting, classing, and packing, comparatively poor prices have to be accepted. Plenty of cases have come before our notice of carelessly-got-up clips realising comparatively low prices. The grower immediately blames the selling broker for sacrificing his wool, and tries another broker the following year, with the same result. It would be better if he set to work to discover the true cause of the low prices . Very often the wool is bundled into bales as it comes off the sheep, bellies, pieces, stained pieces, and locks, even to dags, finding a place in the same bale, and the trouble is that only a certain section of the wool buyers can compete for these carelessly-got-up lots. The wool, if properly separated, might have been bought by buyers for each of these five descriptions, with strong competition for each lot, whereas the buyers able to bid for the clip in its mixed state would leave a good margin when valuing, owing to the difficulty and uncertainty of gauging such lots.

It is reasonable to suppose that it would pay the grower to carefully prepare his wool for market. It is cheaper and easier to skirt and class, both fleece and pieces, as the wool comes from the sheep's back, than later on, when being prepared for manufacture. The buyer, in valuing, has to calculate the cost of sorting and separating before he can fix his valuation. The owner of the carelessly-prepared article finds that his wool seldom or never realises his expectations, and frequently it leads to dissatisfaction and endless disputes.

Few of the small wool growers, comparatively speaking, have taken the opportunity of visiting Port Adelaide wool stores during the busy period known as the wool season. The advantage of comparing their wool with other lots and of picking up knowledge given by experts in the wool trade is thus denied them. Many of the wool terms to them have no significance. They cannot tell to which class their wool rightly belongs, except by comparison with their neighbours, whose wool they haven't even seen; but should they realise ¼d. to ½d. per lb. less, woe betide the selling broker.

What we would impress, and this is most important, is that the gross money return per head is the truest and best guide to a sheepfarmer. For instance:—A's sheep cut 10lb., which average 9d. per lb. equals 7/6 per head. B has lighter, drier, perhaps cleaner wool; he cuts 7½lb., which average him 11d. per lb. equals 6/10½ per head. A is thoroughly dissatisfied with his broker, but at the same time he is making 7½d. per head more than his neighbour, though B got 2d. per lb. more for his wool. This on 500 sheep is equivalent in money to £15 12/6.

We will now show how the defects complained of can be obviated :—

The woolshed, used altogether for the purpose of shearing sheep, or the barn fixed up temporarily for a woolshed, should be properly swept and cleaned before shearing commences. See that each sheep is evenly shorn, so that second cuts may be avoided; these are a loss, as usually they fall out among the locks, and leave the rest of the staple so much shorter. When the fleece is off, it should be carefully gathered up, and put on the wool-roller's table, which should be at a convenient place near the shearing board. When opened out, or thrown on the table with the outside of the fleece upwards, it should be trimmed, or skirted. In our South Australian farmers' wools, generally all that is necessary in the way of skirting, after removing the belly, is to slightly trim all shabby or sweaty pieces off from the edge of the fleece, so that the fleece is left looking clean and attractive to the eye. Of course, all dags and stains come off, and the stained pieces which are taken from the male bellies can go in with the other stained pieces. The bellies, both male and female, can then make one lot, to save making too many lots in a small clip. If only one-half a bale each of bellies and pieces, put them in one bale, separated by a piece of bagging, and with a marked line on the outside of the bale to show where the division is, as this is better than mixing the two sorts together.

Rolling and Classing. — When the fleece is skirted to the intelligent satisfaction of the farmer, roll up by turning in towards you, the far side, then turn over again towards you, and you have the fleece in a strip, say, a foot to one and a half feet wide, with the outside of the fleece turned inwards. Roll up from the breech along the side to the neck. The fleece is now ready for classing.

In our small South Australian clips the sheep as a rule run fairly even in quality. It is generally sufficient to make two classes, putting in the top lot all bright, well-grown, light, sound and lustrous wool, and throwing out for the second class all those yellow, heavy in grease, earth, or sand, and dingy or unsound fleeces.

From here the wool goes into the bale, and, after packing neatly, has to be branded. Brand everything, however small, even to bags enclosed in bales. Number from one onwards in consecutive order; avoid duplicate

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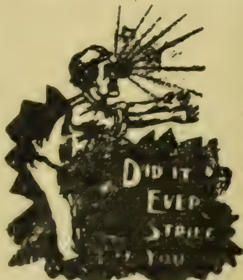
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numbers, as they cause endless annoyance and confusion.

Branding.—There is one right way to brand a bale of wool, and one only. Brand on the top or flap end, also on front side. The front is that side opposite to the seamless side of the flap. Brand first the brand, then the description, then the number.

The reason for branding thus is: if branded on one end only, the other end is left for the buyer to put on his counter-mark after the bale is dumped; besides, it has occurred that the number has been chaffed off on the waggon or on the truck, and when re-trucked at the break of gauge has the other end down, and that number, brand, or description has been effaced or chaffed beyond recognition, and you have a bale with perhaps no identification marks, or perhaps no number.

Then when sending to market a way-bill should be forwarded, together with an advice to the broker.

Some small clips come to hand in good order, while others show that an effort has been made to do something. A wonderful change for the better has taken place in this State during the last five or six years, and we sincerely hope it will continue.

Before finally closing this article, we would add a word of advice in respect to selling. Do not hamper your broher with excessive reserves: he knows the value of the wool and the state of the market better than you, and it is to his interest to realise as high a price as possible for the produce committed to his care. Re-offered lots are not favourably received by buyers, and thus a reserve, instead of being a protection, may become a source of loss.—Elder's Review.

Successful Dairying.

One of the best dairy herds in New Jersey is that at the New Jersey Training School (says an American exchange). Supt. E. R. Johnston was impressed with the importance of dairying at the time the school was established in 1888. The herd now consists of olny pure-breed Holsteins. Supt. Johnston saya they have stuck this breed in preference to all others, because they have found Holsteins produce more milk per pound of grain fed, are more hardy, less susceptible to diseases, and are of a more quiet disposition than some other breeds that have been tested on the place. At present the herd consists of forty-eight head, including thiry-three dairy cows.

The records of some of the best animals are as follows:—Fill a pail No. 9, 6 years old, 10,537 lb. milk, one day's record 50 lb., week's record 334 lb.; Queen No. 5, from December 1, 1904, to December 1, 1905, produced 16,101 lb., day's record 51 lb., week's record 324 lb.; and Bloss No 4, 6-year-old cow, with a year's record of [illegible] lb. milk.

The dairyman in charge, in a recent interview, said:—"A daily record is kept of the milk yielded by each cow. The nervous temperament and disposition of each animal are also observed and recorded. Each cow is bred so as to calve every year. The heifer calves showing the most favourable points in regard to milk yield, disposition, type, size, etc., are raised and added to the herd. As the milk from our herd is used by the children at the training school, it is necessary that we have a uniform supply the year around. For this reason we have two or three fresh cows in every month.

As a rule, the calf is left with the dam until it is two days old, when it is taken away. If the cow for any reason has inflammation in her udder in our experience it seems best to keep the calf with the cow until she has fully recovered. When taken from the cow, the calf is placed in a stall by itself and fed from eight to ten quarts of its mother's milk three times daily. We use a calf-feeder and find it very satisfactory. As the calf grows older water is added to the milk and the milk decreased at the same time. We also add a small amount of calf feed which we are using with good results.

The milk is gradually decreased, and the calf is weaned when about four months old. During this time it is encouraged to eat silage, grain, and hay, or corn stover. The grain is the same as that fed to the cattle and is given to the calves sparingly. We allow the young stock to eat as much roughage as they want. They are handled as much as possible during the first two years. As a consequence, by the time the first calf comes the young cow is so well trained that she can be milked without any trouble. We usually breed our heifers when they are from 18 to 21 months old.

Ring Worms in Sheep.

Apropos of the experiments carried cut at the Experimental Farm at Glen Innes, N.S.W., with a view to finding a cheap and effective method of treating lung worms in sheep, the method in which these parasites reproduce themselves is interesting. The young of these worms escape from the lungs of infected sheep, and become scattered over the pastures, etc They are then swallowed with the grass or water and find their way probably, says Curtice, "through the blood-stream" into the lungs of the sheep. Arriving at the extreme ends of the bronchial tubes, they break down some of the tissues and become encysted. In the cyst they grow to adult size and develop sexual character, then, escaping from the cysts, they make their way into the small air-tubes, where the sexes mate and reproduce. The eggs are then laid, and these hatch into young worms, which find their way into the lungs, whence the sheep coughs them up, and the whole process begins over again."

Terrible Nerve Neuralgia

THE SLIGHTEST TOUCH OF HER HAND MADDENED HER

CLEMENTS TONIC
CURED

Is there any ailment that makes the body so sensitive to touch as Neuralgia or Inflamation of the nerves? Is there anything to compare with the agony of sleepless nights, caused through nervous neuralgia of the face? Yet when it is caused by bad liver or stomach as it is often is, Clements Tonic is the rapid remedy. Read this letter from Miss Mary Renton, 88 Highnet Street, Richmond, Vic., written, 9/9/11:—

CLEMENTS TONIC LTD.,

"I have not heard of a parallel complaint to mine. To show the various forms Neuralgia will take, which I had for one year, every hair of my head came away, and the slightest touch about my head or face would cause intense pain. I am thankful to say, since recovering my health my hair has grown rapidly again. On one occasion I was in the hospital for kidney complaint, and they did the best they could for me; but my nerves were all unstrung. One of my own family brought home a couple of bottles of Clements Tonic for me to try, and I soon found it was the medicine I was in need of. I kept taking it for four months, and am in robust health. I have no fears of the above complaints with a bottle of Clements Tonic in the house, and I think no home should be without it.

(Signed) **MARY RENTON.**"

This is but one case of hundreds. This medicine is equal to a doctor in your home where they are unobtainable. It gives new stomach strength, appetite, regularity of t e bowels, good rest and permanent health. ALL CHEMISTS & STORES SELL IT EVERYWHERE. Get it and get well, and live healthily.

Brittle Hoofs in Horses.

Nothing is more annoying to the owner of a horse, or taxes the patience of the shoeing smith more severely, than brittle hoofs which he has to shoe. The cause of this condition has been the subject of inquiry for a long period. Some authorities have held that it was due to the custom which is now almost, if not quite, obsolete, of paring and rasping the hoofs for the purpose of rendering the surface smooth and glossy; in many cases the operation was conducted to a greater extent with the idea of improving the shape of the foot. It has been observed that some people preferred to have clean-looking rounded feet, while others are content to take the shape of the foot as nature left it so long as the surface is kept smooth and is susceptible to the polish which can be obtained by the application of the oil brush. These causes, no doubt, are in operation. Constantly rasping the feet, allowing evaporation from the fibres of horn which terminate running obliquely on the surface of the hoof, would haev something to do with rendering the part dry, and, therefore, brittle, preventing the natural elasticity of the horn which exists in full perfection if the parts are left altogether untouched. One inconvenience which is attached to a brittle hoof is the difficulty of getting a sufficient hold for the nails to keep the shoe in its place, and, as has been remarked, the ingenuity of the shoeing smith is frequently taxed to obtain this desirable result, and to find nail hole after nail hole cracking away on the slightest touch of the hammer on the nails is a state of affairs calculated to try the workman's temper, and to end in compelling him almost as a matter of course to make the best of a bad job, and to stick a nail wherever he can find a place which he thinks is likely to hold it, driving it at the same time with the greatest caution, with the fear that the part which he is operating upon will presently shelve away and compel him to draw the nail from the shoe again and seek another spot for its application. This condition of feet would naturally come under the head of unsound feet, and would therefore be included in the list of hereditary disease. Had these processes been really an active cause of brittle hoofs, hardly a carriage horse, hack, or hunter would have escaped, but at this particular period, which lasted for years in the writer's recollection, it was noticed that horses used in rough work whose feet were left uncared for were certainly more subject to brittle hoofs than were those whose feet were regularly pared and rasped. In fact, the whole of the evidence carefully considered points to the conclusion that heredity is the main factor in brittle hoofs.

With the idea of preventing, curing, or, at any rate, controlling the progress of the disease, as it may properly be called, various devices were had recourse to, such as stopping the feet and anointing the outside of the horn with certain hoof ointments. For a very long period stopping the feet of all horses in any stable which had the least claim to be well managed was a ceremony which was adopted as regularly as the feeding and watering of the animal. A box was kept in the stable filled with cow manure, and a roughly-constructed wooden spatula was stuck in the middle to be ready for use, and a stableman who neglected to fill the whole of the bottom of the horse's feet with the material by the aid of the spatula would, if detected, most probably have lost his place. It seems difficult in the present day to understand that such an absurdity was perpetrated in the best conducted stables, not only with the sanction of the owner, but by his stern orders, on the plea that unless the sole of the foot was kept in an elastic and yielding condition the horse would infallibly become lame Over and over again, the shoeing smith, on removing the shoe from a lame horse, has complained that the bottom of the sole is as hard as a flint, adding that the feet had evidently not been properly stopped, and that it was no wonder the horse was lame. This flinty coating at the bottom of the foot, which was, in reality the greatest possible protection to the internal structures, was got rid of easily enough by making the forge shovel red-hot and applying it to the bottom of the foot until the parts became sufficiently soft to yield to the application of the knife. The satisfied operator then worked away vigorously with his drawing knife, slicing off chips of the softened horn as easily as if he were cutting at the rind of a cheese, until the whole surface of the sole would yield to the pressure of his thumb. It is not ne-

(Continued on page 564).

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So much depends upon good digestion that it it in a sence, a kind of slow, unthinkable suicide to court ill-health and indigestion, with its attendant horrors, when a few bottles of this well known and reliable nerve and brain tonic will keep the appetite good and the stomach healthy. That it will do this is placed beyond all doubt by this letter and others equally to the point received. Read it :—

"Tyalgum, Middle Inn.
"12th June, 1911.

CLEMENTS TONIC LTD.

A few lines in reference to your valuable nerve remedy, Clements Tonic. I suffered for some time with nervous headaches, and anything unusual would make me very nervous. However, after I had used four bottles of Clements Tonic I began to feel very much refreshed, and could eat real well. I recommend it as the best medicine I have ever used for nervousness. Many thanks for your 'Everybody's Cookery Book. It contains many valuable recipies. You may use this letter any way you please.

"(Signed)." Mrs. A. BOARDMAN.

This testemony shows what a boon to women as a health restorer this splendid medicine really is, and what years of strength and health women who are now anamemic and ill, may enjoy through its use. All chemists and stores sell Clements Tonic throughout Australia. It is health in a new guise, and all women should remember it.

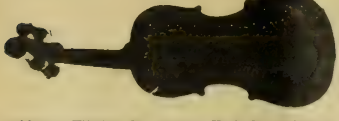
How They Grow Potatoes in Germany.

The Agricultural and Technical Schools of Germany have trained an army of practical chemists, expert in the analysis of soils and familiar with the elemental requirements of every plant known to German husbandry The effective value of every kind of fertiliser, its influence on crops planted in sand, clay, or loam, and the efficacy of clover, lucerne, and other growths when ploughed in to enrich soils in nitrogen are accurately known. The Ministry of Agriculture, through its system of experimental stations, has worked out the whole problem of varieties, soils, methods of planting, cultivation, and harvesting; the farmer has only to follow the methods that modern science has made easy and plain, and with reasonably favourable sunshine and rainfall his result is secure.

The ideal potato land is a warm, permeable, loamy sand or a light moorland, well drained, clean, and rich from the vegetable decay of past ages. Soils containing large proportions of sand produce potatoes of the best flavour and with the highest percentage of starch. A potato field should be open, fully exposed to sun and wind, not shaded or obstructed by trees, and, above all, free from clay substrata which hold water and make a wet subsoil. Superficial scratching of the earth will not do for potato planting. Every additional inch of depth broken up adds a tangible percentage to the yield, and on the best farms subsoil ploughing attains a depth of 12 to 15 inches. Careful experiment has shown that land prepared for planting in autumn yields one-third more than if treated in the same way in the spring just before planting time. Whatever method of planting is employed, care must be taken that all the seed potatoes shall be covered at a uniform depth, the proper depth being from four inches in light, sandy soils, to three inches for loams, and two inches for heavy clay or moorlands. While it is difficult to formulate an exact rule that will fit the different varieties of potatoes and varying soils, the general principle is that in potato culture on a large scale one potato plant, or "hill," is allowed four square feet of space. The German farmer who knows his business plants only large, well-grown, healthy potatoes. Not the very largest are used, however. On well-managed farms in Prussia potatoes, when harvested, are frequently assorted into four grades or sizes, viz.:—(1) Very large; (2) full-sized and perfect in form and condition; (3) medium, and (4) small. Under this division grade 1 brings the highest price in the market; grade 2 is used for seed and is also saleable for food; while grades 3 and 4 go mainly to the distilleries, the starch and dextrine factories, or in seasons of great abundance are fed to hogs and cattle. Seed potatoes are usually planted whole, not cut, as is often done in the United States and other countries. The verdict of scientific experiment is that cutting the seed potato impairs the vigour of the plant, which, in its earliest stages of growth, feeds upon the substance of the tuber, but all accounts agree that large potatoes cut into sections are much better than small ones planted whole

From the standpoint of German agriculture, fertilisers and the preparation of the land is the most complicated and important part of the subject. The three essential elements to be provided by artificial fertilisation are phosphoric acd, potash, and nitrogen. The first is obtained through the application of mineral phosphate. Thomas slag phosphate meal, or bonedust. Thomas meal is applied in the proportion of 1,000 to 1,200 pounds per acre, but being sparingly soluble it acts very slowly on the growing crop, and in dry seasons hardly at all. It is most effective in moist soils, and in seasons of abundant rainfall. Steamed bonedust is used—300 to 400 pounds per acre—by being strewn over the land in the autumn and ploughed in. Superphosphate fertilisers are used in the spring and are deposited and covered with the seed at planting time. Far more important, however, for potato culture are the potash-bearing fertilisers. These are plentiful and cheap in Germany in the form of kainite and carnallite minerals from the mines of the Stassfurt district, near Magdeburg. The enormous development of potato production in this country during the past thirty years has been due to no other fact so potent as the exclusive possession of an unlimited supply of potash minerals.

Many of what are now the best potato lands were twenty years ago deficient in potash, for the reason that the potato consumes that element in large proportion, so that the organic natural supply had long been exhausted by ignorant, unskilful cultivation. What was needed was to restore the exhausted potash. But it was found that neither kainite nor carnallite—both of which contain traces of chlorine—could be used raw and directly as a manure for the growing crop without impairing the flavour of the potato. To produce the best effect these mineral fertilisers have to be digested and assimilated with other elements in the soil. To secure this result they are applied during the preparatory process, one or two years before the land is planted to potatoes,



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and serve to nourish the clover, the lupine, or other fallow crops that are grown and ploughed under as manure. By this method the potash salts are not only digested, purified from chlorine, and mingled thoroughly with the soil, but it is enriched by the nitrogen of the buried vegetation and prepared for the abundant growth of potatoes of the highest quality, rich in starch, and of the standard flavour.

Nitrogen is applied in the form of stable manure worked into the soil during the one or two years previous to potato planting, and the Chili saltpetre, which, as already described, is used as a top-dressing, applied directly while the plants are growing. Chili saltpetre covered in the earth either leaches away into the subsoil or forms insoluble combinations with other elements and is thereby lost to the farmer. Used as a top-dressing it has an immediate and often important effect in reviving and stimulating a crop, but it should never be applied to the soil in autumn nor in the spring before the potato sprouts have appeared above ground.

Reduced to its simplest terms, the secret of German pre-eminence in potato cultivation consists in the careful, patient, scientific preparation of the soil, not only by the restoration of its exhausted elements but by mellowing, enriching, and revivifying it by deep cultivation and the ploughing in of green manure crops, which have taken up and digested the crude mineral fertilisers. Land thus prepared will yield three or even four crops of potatoes before their quantity or quality will begin to deteriorate. In extreme cases, where a small farmer cannot advantageously raise any other crop, he may continue to plant potatoes on the same ground ten or twelve years, but good husbandry dictates that as a principle a change to cereals, beets, or clover is advisable after the fourth successive season of potatoes.

◆

Clotted Cream.

This peculiar and luscious cream is made by scalding the new milk as soon as cold after taken from the cow. It should be scalded to just short of simmering, say from 175 to 100 Fahr. for the cream that is to be used as cream, and to 160 Fahr. where the cream is to be used for making butter

So it is seen that clotted cream may be used for making butter the same as raw cream, or ream, as the Devonians call it; and it makes prime butter, the other management being equal.

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(Continued from page 561).

cessary in the present day to explain that the natural condition of the bottom of the horse's foot is one of unyielding density, with the addition of exfoliating portions which break off readily at the touch of the smith's knife, and are the only portions which, as a rule, are necessary to be removed, leaving the bottom of the sole hard and unwielding, and so capable of resisting the blows which would necessarily be received from loose stones and other foreign bodies during progression. In the treatment of brittle hoofs it is probably not a matter of much consequence what remedies are employed. The preparations of tar and grease, turpentine and some colouring matters can have little or no influence upon the outside of the horny structure. The suggestion that they block up the openings of the horn tubes, and thereby do harm instead of good, is not worth much consideration. Even if the applications had that effect it could only apply to the surface, whereas the brittle condition of the hoof must necessarily be due to some defect in the secreting structure, which, in the case of the wall of the foot, is the coronary band. The most rational form of treatment undoubtedly is that which is applied to the coronet, and any stimulating application, such as ointment of lard and turpentine applied with friction to the coronary surface may do some good by improving the circulation of the part, and stimulating the secretion of new horny material. If anything is to be done to the exterior of the hoof, the application of wet swabs is the most effective remedy.

◆

It is always gratifying and encouraging to those who are engaged in a good work to hear that their labours are not in vain. Patients who have been cured by Vitadatio, the well-known herbal remedy and gratefully acknowledge it are most heartily thanked, they have in turn benefitted others by their good report. In this connection our readers will see from an advertisement of Vitadatio how Mrs. Webster was cured twelve years ago, and continues in perfect health to-day. We are assured that Mrs. Webster's is only one out of hundreds of cures of diseases of all descriptions achieved by this marvellous herbal medicine, which is a product of the Commonwealth. Mr. S. A. Palmer, the distributor of the remedy, was himself cured of hydatids by it, and he asks all sufferers to write him for full particulars of Vitadatio at his address, 129 Flinders Lane, Melb.

Poultry Notes.

Breeding and Preparing for Show.

— From Start to Finish. —

Breeding for the show pen may be said to start from the time the parents of the birds that are desired for exhibition are being carefully selected to mate up, for it is from that time that the ambition breeders must be prepared to work with the object of producing chicks which will not only embody the desired type and colour, but will be of the healthy, vigorous sort that will go ahead from the shell, putting on bone and sinew and never looking back.

We will assume that the breeder has acquired the knowledge necessary to enable him to mate up his pen, as many chapters might be written on this subject alone if the various breeds were to be considered separately. The mating, therefore, being done to satisfaction, and the hatching brought about in good time—a month or two later for the light breeds, especially Leghorns—it is necessary to keep the show pen and its requirements in view when dealing with the chickens right from the start. Keep them tame by careful behaviour among them and frequent handling. It is astonishing what a pull the breeder has who constantly handles his youngsters, and how this enables him to form an opinion of their ultimate merit long before the less careful breeder who leaves them alone until they are several months old, as many do. It being essential that nothing shall check the proper development of the chicks, lice and vermin of any sort must be absolutely taboo—and it goes without saying that the feeding must be of the very best for future exhibition birds. Extra coarse oatmeal given dry should take the principal place in the diet of the very young ones, changing to groats after the first six weeks or so: while milk as a drink is excellent. For the first six or eight weeks the best possible food should be given to all chicks, but from that time the breeder should begin to sort out into "likelies and impossible," the former then getting the choicest feeding, while the latter must conform to the utility chicks' diet until such time as they are old enough to be disposed of or killed for the table.

To the "likelies" the ambitious breeder now turns his attention, and at about four to six months (according to the variety) should be able to again do a sorting, thus reducing the "likelies" considerably, and being able to form quite a reliable opinion as to which will be the best specimens. Another overhauling should take place a month or so before the birds reach maturity, and by that time the earlier shows will not be far off.

In the meantime, the sexes will have been separated at from three to four months, as early as possible being the golden rule, and every attention given to the general work, cleanliness, good feeding, and a plentiful supply of quite fresh green food — nothing is better than growing lucerne — being a sine qua non.

In the case of the cockerels, some difficulty will now be experienced, as the bigger and stronger will bully the younger and weaker; so division and subdivision of the pens may be necessary. No cockerel will attain his full size if continuallly chased about by older birds. In fact, with both cockerels and pullets it is necessary to only keep birds of about the same age together. Several small pens will be found of the greatest service to exhibition breeders. They are made of wood, about 30in. high, 30in. broad, and about 66in. long, with narrow bars at one end and a door in the middle of one side, Having no bottom, it is only necessary to move them every day or two to ensure the occupant being always on clean earth. For cockerels intended for show, or cocks getting through the moult, they are incomparable. For two or three exhibition pullets or a hen and chicks they are also useful. They will also serve as a roost for several fowls in a run by adding a perch lengthwise.

It is necessary in all cases, and with white birds absolutely essential, that they should be kept under shade—preferably that of trees, as being the coolest—from the third or fourth month of age, the sun being a great enemy of the fancier. About six or eight weeks before the first shows, the final overhauling takes place, and the breeder then selects those he intends to exhibit himself, and should do his best to dispose of the remainder, except, of course, any he may wish to reserve in case of accident or as stock birds. He should be able to get a very good price for good specimens that have been reared from the shell with the intention of being exhibited, as many who are unable to breed good ones are forced to purchase or stand no chance of the advertisement of a success in the show pen.

A few small pens, about 30in. square and the same height, are now brought into use, and placed in a sheltered position where about half an hour of the newly-risen sun's rays may be obtained. Sunlight, as a rule, is to be avoided, but birds that are to be kept in training for a long period need a little in the cold weather as a tonic, and when just rising it does no harm to the colour. The future competitors for honours are placed in these pens for an hour or two each day, while the fancier puts in some time and patience in causing them to remain quiet when people gather about them, and to show themselves off to best advantage when a judge's trick is introduced. This is easiest brought about by putting the bird in the training pen first thing in the morning, when it is hungry, and only giving it a little food at a time—something choice which it must take from the hand. Small pieces of meat, or insects, on a stick will soon cause it to look on the judge's wand as a welcome intruder. It is not advisable to keep the birds in the training pens for more than two hours daily, as they need an earth floor and more space as permanent quarters. When they have become quite tame, the training pen need only be utilised two or three times a week. In the case of the Mediterranean breeds, "comb-over" in otherwise promising cockerels is frequently caused by too long confinement in a small pen. When this starts, hold the comb under a tap of cold water for two or three minutes morning and evening, afterwards gently rubbing it until the circulation is restored. The rest of the day the birds of both sexes should be kept in pens, or in small well shaded runs. Hens or pullets will frequently thrive better in company, but must be carefully wtahced to see that all are quite contented and that there is no fighting.

Birds with white lobes and yellow legs will require these parts frequently attended to. Green grass is the best thing for yellow-legged fowls to have as flooring, but if that is unobtainable dipping the legs into water once a day will retain the colouring. Vaseline rubbed in now and then will also help in that direction. For lobes there seems to be nothing better than bathing once a day in milk and water, carefully drying afterwards, and sprinkling with a little powdered zinc. Gentle manipulation must also be given if any signs of creases or folding are visible. The general condition of the bird must be carefully watched. A little fresh-cut green bone or raw meat chopped fine should be given every day or so. Bread and milk, just well moistened, not sloppy, make a good morning feed, and the very best oats and wheat should be be given as hard corn. Games and other varieties that require tight feathering should have little, if any, soft food, and should have a few peas added to the ration of corn. Sharp grit must always be within reach, and some quite fresh green food (lettuce they are very fond of) must be supplied daily. On no account must food be allowed to lie in front of them, so this tends to make confined birds sicken of food and lose condition very quickly. "Well-fed but always hungry" is the principle on which to work, so that when the judge or other person approaches the fowl puts on an intelligent and friendly look, as though it is interested in things generally and the chance of a dainty morsel in particular.

If it is intended to exhibit at a number of shows, the fancier must consider in good time which bird to exhibit at which show, for it is seldom possible to have an exhibit at its very best for an extended period; but, if a careful method is adopted, with some experience it becomes possible to bring a bird to tip-top condition at any given time. The less stimulants that have been given to the youngster during the period of growth, the easier it will be to bring this about. With regard to cockerels. Give him Douglas Mixture as a sole drink (sulphate of iron, 8 ounces; sulphuric acid, ½ fluid ounce; 1 gallon water); reduce the amount of soft food to a minimum, and add to the supply of meat, about three weeks before the show. About 14 days before that time, place a couple of carefully selected, clean, healthy hens with him in the pen he spends his days and nights in; this will improve his carriage wonderfully. Take the hens away, however, about four days before the show. Thus, when he finds himself in the exhibition pen, with beauties of all kinds and rivals of his own sex within sight, his carriage and pride of gait will make him appear to great advantage.

In the case of the pullets, the procedure is similar, except that no male bird must be with them, nor with the hens from the time they started moulting. Here it is the laying that is to be considered, for a hen looks her best when just starting to lay after a rest. Thus the feeding should tend to check all laying about four weeks before the show, but from about three weeks before give the tonic and increase the supply of nitrogenous food, so as to bring her on to lay, if possible, just prior to the date when she is to look her best.

Having by constant attendance and care brought his exhibits up to concert pitch at the right time, our fancier must give attention to the cleaning and touching-up which is necessary before despatching them to the show. White birds must be well washed three days before exhibiting—not later, as the feathers must be absolutely dry or they will not "web" properly. Use three waters—the first warm, with plenty of soap, which must be worked well under the feathers; the second also warm, in which they must be well rinsed; the third cold, with a little blue in it, in which the rinsing must bt repeated, as not a trace of soap must be left. Dry carefully, and keep the bird warm. Let it pass the night in a basket in the kitchen, if possible. Legs of all varieties must be well cleaned with a brush, soap, and water, dirt removed from under the scales by means of a quill toothpick; then rub in a little vaseline, and polish with a soft cloth. Clean the comb and wattles with vinegar and water on a sponge, and dry well. A little vaseline is as good as anything to finish off these parts with also, if well rubbed in and wiped off with a soft cloth; but various mixtures are advertised for this purpose, and a little experimenting on ordinary fowls will soon find out the best. The plumage should be carefully smoothed down with a soft cloth.

When despatching, give the bird a roup pill as a safeguard, and see that the box or basket it travels in is clean, dry, and free from draughts, contains some clean cut straw or sawdust as litter. You can then feel satisfied that, win or lose, you have done your best—than which no one can do more.—"Australian Hen."

WANTED TO SELL.

INCUBATORS AND BROODERS, Simplex, awarded first price (silver medal) Adelaide Exhibition, 1910. Agent for Cort's Patent Cooler-safe, a boon in summer. Send for price list.—D. LANYON, Manufacturer, 46 North Terrace, Kent Town. 6-12.

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Give the fowls fresh water three times a day in hot weather. Never put it in the sun. Sun-heated water is often the cause of disease.

Profits in the poultry yard do not hinge on breeds and varieties, but on birds. Breeds have certain characteristics, but it is the individual which pays or fails. The poultry-keeper will do well to take notice of each bird, and its performances, and not rely on the fact of their being of this or that breed.

TICK

South Australian poultry owners have found that the very best remedy for the TICK CURSE is

Faulding's

Phenytas.

Periodically dip the infested birds and spray infested houses and runs with Faulding's Phenytas and therewill be no further fear of tick.

FAULDING'S PHENYTAS is Absolute DEATH TO THE TICK

The Perches.

As the hens spend about half their time on the perches, the construction of them is of some importance. In times past, it was customary to make the perches ladder fashion, the first rung near the floor and then higher and higher to the roof. Such perches are an abomination. The hens fight for the highest places and in descending them seldom use the ladder, but generally fly from the top.

I know a poultryman who has his roosts on a level eight feet high. Now a hen flying from that height is liable to strike the ground very hard or get injured in striking against the house or other obstruction, and that is not all: just watch them going to roost. It is a common occurrence for three or four of the stronger birds to take a position near the head of the ladder, then woe be to the late comer. She will be pecked and thrown down until in desperation she seeks a place outside.

Now, this can all be avoided by making the perches lower. Twenty-four to thirty inches is about right. It is true young pullets like a higher seat. I have seen them fly up against the roof in their endeavours to get a better position, but after they fall a few times they get over that kind of foolishness and become reconciled to low perches. They are in every way the best. If a bird gets pecked or crowded off, it walks around until it sees a better opening and in the morning they can all get down without any trouble.

High perches are the cause of many a pullet acquiring the habit of high flying, which is very annoying. All the smaller birds, such as Hamburgs, Leghorns, Minorcas and others, can fly over a six-foot fence when once they learn the power of their wings.

The roosting poles should be flat, not less than two or three ins. wide. I have seen perches made of one inch boards set up edgeways with sharp corners. That is all wrong. Fowls cannot sit comfortably that way. On a three inch surface with the corners taken off a hen can spread her toes and with her claws reach over the corners fore and aft. That way she can balance herself; her weight rests squarely on her toes and she can sit with some comfort. The poles should be loose, so they can be taken out when cleaning the house. I aim to provide good roosting places for my fowls, and then insist that they use them. Never allow a hen to roost in a tree, barn, or any other place, except the proper one. With a little patience and persistance they can be trained to go just where they ought to.—American Poultry Journal.

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Breeding Turkeys.

Turkeys should not be restrained. They require much more exercise than chickens. Without a free run they soon show signs of loss of health and thrift, perceptible, perhaps, to only the watchful eye that knows well the springy bearing, glossy plumage, bright eye and plump body of the turkey, the surroundings of which are suitable and agreeable. No other food that can be provided for a turkey past one month of age is so good for it as that which it will find for itself in the fields; and at the same time a large flock of turkeys is no inconsiderable help in keeping down insect pests. The favourite food of the turkey is the grasshopper, but many other insects are dainty morsels for its palate, eagerly sought for.

However, it is best to restrain the turkey somewhat, and absolutely necessary to restrain it until a month old if satisfactory results are to be obtained. Strange to say, the instincts of the mother turkey are not altogether conducive to the well being of her brood. For example, she will lead them through the grass and weeds, while yet wet with dew in the early morning, until the poults are drenched; and young turkeys are very susceptible to moisture. They are much more easily drowned than are young chickens. Drenched with the dew from the grass and weeds, apparently their strength forsakes them and they sink down to be lost and die, while their mother marches on through the wet grass apparently oblivious of their loss. It may be domestication has so weakened the turkey as to take from it much of its ability to withstand moisture while it is young, without lessening the instinct of the mother to lead her brood forth to eat in the freshness and dewiness of the morning—another evidence that mind is more enduring than matter. However this may be, if one does not wish to have half of the brood lost in the wet grass or weeds, he must keep them penned up until the dew or rain has nearly or altogether dried off the grass. A pen made by standing four wide boards — say 20 inches wide, — on edge, and holding them in place by driving stakes against them, will answer. Whenever the poults can get over the boards they can endure the dew. If some short boards are laid across one corner to form a roof, and this corner is protected from surface water, the pen makes as good a domicle for the flock as can well be devised.

A hen will hatch and mother turkeys, and mother them almost or quite as well as a turkey. During the first month of their existence she will not take them on the harmful long tramps through the wet grass that I have just written about. But after the poults are a month old the turkey makes the best mother, as she knows best where abounds the food best for them, while a hen will not lead them on those tiresome long walks that are to obtain that food. At this time a brood mothered by a hen will leave her often if there is a brood mothered by a turkey to join. This is a consummation devoutly to be wished for.

The plan that I have found the best is to have most of the turkey eggs hatched by hens. The turkey nest is systematically robbed, three or four of the fresh eggs being allow-

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Pen 3. Headed by a vigorous young Cockerel of great size and broad back, very low set, with good females. **Eggs. 21/- dozen.**

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The Ringlet Strain.

They are barred to the skin: fine feather, fine layers.

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are veritable egg machines—won every 1st and Special Prize in Adelaide Shows during 1911—also won all prizes at March Royal 1912.

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15 Eggs to each setting. Guaranteed fertile or replaced. 10/6 per setting.

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ed to remain each time, for if all the eggs are taken she may change her nest and not lay for some days. When the nest is thus robbed the turkey will lay three or four times as many eggs, before the desire to sit takes full possession of her, as she would otherwise. When she gets so desperate as to go hatching on three or four eggs, the only thing to do is take the eggs and destroy the nest, or allow her to sit. It is well to put turkey eggs under two or three hens at the same time. Then, as the turkeys are hatched out, all may be given to the turkey to mother. Usually she will take them readily enough if they are placed in her flock, but if she shows a disposition not to receive the extra charges, if they are slipped under at night she will adopt them in the morning. A good turkey will mother fifty poults as well as a dozen. Of course they must have a good shelter, as she cannot well cover so many.

The bronze variety is the best turkey for the general farmer. It is the most disposed to roam, and in a neighbourhood where the majority have flocks of turkeys it is necessary to curb the roaming disposition of the bronze, if one does not wish to be subjected to the annoyance of being accused of having some neighbour's turkeys, when likely at the same time, he is certain that some neighbour has some of his turkeys. This condition of affairs not infrequently leads to neighbourhood quarrels and sometimes to lawsuits. The bronze can be kept nearer home by feeding it regularly at least three times a day, no matter if the feed be very light, by giving it some dainty morsel, to tempt it to come home each night; by bringing the young flocks home each night, if they do not come of their own accord, for if brought home while young, they are almost sure to come of their own volition when they are older; and by petting them, while the turkey, and especially the bronze, is a shy fowl, it is very susceptible to kindly attention. It likes to be fed from the hand and to be stroked, and such treatment makes it less disposed to spend its time away from the haunts of men.

Rightly handled and it is not difficult to handle them properly turkeys are among the most profitable products of the farm. During the warm season they get, more than any other class of fowls, their own food, and this food is not only of no cost to the owner, but is of such a character that its destruction by the turkeys is a positive gain. Of course, when they are to be fattened for market they must be fed liberally of food specially prepared for them. This food should be largely of corn. While fattening turkeys should allowed to take only moderate exercise, else they will "run off" a considerable part of what should be gain. I find that the best plan is to confine them in a lot surrounded by a high fence, and to clip the feathers of one wing, to that the fowl cannot fly. Not to fatten the turkeys thoroughly is as foolish and wasteful of profits as to grow swine or cattle and put them on the market when only partially fattened. Turkeys are very hearty eaters and if properly fed they soon fatten.

Nearly every turkey grower markets his surplus for Thanksgiving, Christmas or New Year's and the result is to glut the market and bring down prices at these dates. The better plan is to market at other times — before these dates rather than after them; for before these dates, as nearly all the turkeys are being held in fattening pens, very few are on the market and the demand and prices are good, while after these dates the appetite of the public for turkeys is not so keen, consumers have a vivid remembrance of low prices, and there are considerable offerings by those that were disposed to sell at holiday prices and who are naturally eager to get rid of the fattened stock. — The American Stock Keeper.

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The most common causes of failure in poultry farming are under or over feeding, impure water, poor ventilation in the houses, filth, and vermin (the result of neglect in cleaning out the pens and the houses). Worst of all, indiscriminate in-and-in breeding.

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The Australian Hen
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Hatching.

If you are not fortunate enough to have an incubator and trust your fickle hen, after she has manifested a desire to sit by clucking and being ruffled in temper as well as feather, it is time to find out if she means business. If so, she must stop her foolishness and get to work. To find out for a certainty, place a few china eggs in a nest and at night quietly move the hen to the china eggs, and if she sits contentedly twenty-four hours she may be trusted with the eggs selected for her. This is a good precaution, particularly if the eggs are high priced.

If by some chance she deserts her eggs during incubation and the eggs become cold, do not destroy them; try to find another hen ready to sit and give her the deserted eggs. In preparing the nest the shade and seclusion of a tree is most desirable. Sprinkle it with carbolic powder, also the hen, and repeat a couple of times while she is sitting. After the chicks commence hatching do not disturb them for twentyfour hours; then remove them with their mother to their coop. At the same time apply a little melted lard to their heads and throat. This will prevent head ticks from annoying them. Three-quarters of all the chicks that die before they are two months old are killed by vermin. The first feed should be hard-boiled eggs chopped finely.—Exchange.

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Housing the Layers.

Our present experience in housing laying hens with the non-layers will probably prove interesting reading writes Commercial Poultry. In view of the fact that we have had a large number of youngsters to care for, we were compelled to place the laying females with the non-layers — something we very seldom do unless a case of compulsion, as was the case in this instance. Our experience this fall in being compelled to place the females of all ages and grades together, reveals the fact that such a practice proves detrimental to the egg-production, and it is not long in doing it. The fowls that were laying satisfactorily before placing all together, showed a falling off in number of eggs the third day. The reason is obvious. We were not only overcrowding the layers for room, but were compelled to provide different foods, some not suitable for heavy egg yield, consequently by the overcrowding and change of food soon brought a halt to the egg supply.

We are thoroughly convinced that if we have fifty hens and ten are laying, it will be wisdom to place the ten laying hens out away from the non-layers and feed them intelligently for heavy egg production, and as fast as the non-layers begin laying, remove them out with the layers until you get around twenty-five placed in the pen. Then stop and prepare another compartment of twenty-five more layers, and so on, until you have your entire number of females laying and in separate quarters of twenty-five females each, and we will stake our all on it that if each pen is fed intelligently, you will get eggs in abundance; at least this has been our experience.

To only use the exact number of twenty-five to each pen is not absolutely necessary. We only use this number for convenience, but the variation should not run over three or four either way. Our opinion is, if only ten females were kept in one compartment, there would be a still larger per cent. of eggs realised to the number of hens kept. However, at the most, not over 30 hens should be housed together in one department for best egg production.

Again, there should be no mixture of hens and pullets. Here is where our trouble is at the present time. In getting heavy egg yields, we could always accomplish best results by placing birds together as near the same age as possible, as near the same stage of laying as possible, for the reason that fowls of various stages in life require different manner of feed and care, the same as the human family. You never see the practical stockman or dairyman housing and feeding dry cows, heifers, fat cows and fresh cows all together in order to get a heavy flow of milk or highest test in cream. Such an idea even would be absurd. Likewise the same is true in managing fowls. The successful dairyman thoroughly familiarises himself with each individual cow and feeds her according to her individual requirements. We can not handle our laying hens in an individual manner, but we can handle each class of laying pens in an individual manner. In fact we must do this in order to get satisfactory egg yields during the winter.

Young laying hens can stand much more—in fact require more—carbonaceous food than old hens In our recent experience with fowls of various ages, the food that placed the pullets in prime laying condition, caused the older hens to become too fat. Hence, the necessity of regulating the foods according to the different ages and stages in laying. We find that certain females need but little starchy foods, but should be fed largely on phosphates, such as wheat or wheat bran, while the younger hens require more carbonaceous food. A food composed of protein and lime is needed for the young hens, while the old hens will respond more readily on phosphates and lime. No matter how well bred or how strongly the females are trapnested for heavy egg production, the supply of eggs will never be satisfactory where all ages and grades are jammed together, as mine are at the present time.

We find that there are natural non-laying hens in all flocks, and no matter how well managed or fed for eggs, they will never respond. Fowls that simply will not adhere to petting nor kind treatment either should be prepared for the market. We have a fattening stall we use for this purpose and all females, as soon as detected as non-layers go in this stall, separated from the laying hens, at once and are fed all the grain they will eat, together with a small amount of nitrogenous foods in order to repair waste tissues. At same time nitrogen helps to digest the food, promoting fat more rapidly. We sell as soon as the fowls are fat, as we find it a loss in endeavouring to exceed certain conditions. We compel our fattenings to become hungry every day, then they will eat more eagerly and fatten very easily. If once stalled on their food it is an everlasting task to ever get them back on to their rations again. In future we shall make a strong effort to have sufficient houses to accommodate all fowls of different stages and purposes, and know we will be amply remunerated for the extra expense.

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Procuring Fertile Eggs.

— Quality and Management of Fowls for Procuring the Highest Percentage of Fertility.—

The fertility of eggs depends largely on the quality of the stock. If we expect to have a large per cent. of fertile eggs, we must breed stock that has stamina and strong vitality. We must properly mate and feed to produce fertile eggs.

For breeding, every poultryman should use birds of strong and vigorous temperament; birds capable of reproducing their characteristics in their offspring. From such birds we may expect, under proper conditions, to get a high percentage of fertile eggs.

Having birds possessed of these combined qualities, provide a house that is well ventilated, commodious and clean, and have it so constructed that the pens will be warm in winter. Let it be large enough to give a limited number of fowls all the exercise they need. Birds crowded in close quarters with not enough exercise, will soon have impaired health and cannot, on any account, produce very many fertile eggs, and those that are

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fertile will generally bring weak and sickly chicks.

It is plain that selection in breeding can accomplish nothing unless the birds are first surrounded by favourable conditions. First, have the conditions favourable, then select your birds with judicious care, having constantly in mind the object sought for in selecting your birds.

The bird of superior merit not only has more good points but it has fewer bad points. When we select and mate two superior birds, their merits are doubled and their defects are divided, as compared with the merits and faults of birds reproduced in their offspring. The above we find especially true in mating birds; if we mate birds showing stamina and strong vitality, we look for a higher per cent. of fertile eggs, and this special characteristic will be established in their offspring.

When selecting a male bird we must not lose sight of the fact that he comprises half the flock. It is therefore expedient that we select one that is strong and vigorous and well developed in his sexual qualities and showing nothing of weakened vitality.

As regards the selection of females, we must take into consideration the fact that each flock has three classes of layers, viz., the heavy layer, the average layer, and the poor layer. Each flock has hens whose eggs hatch well and also whose eggs are almost entirely infertile. We have no rule whatever that the heavy layer is identified with the infertile hen. If we assume that the heavy layer's eggs are infertile because of heavy laying, we are just as far from the fact as the statement that the poor layer's eggs are infertile because of the few eggs they lay. Where stimulants are used to increase the egg yield, or if a hen is forced to lay two hundred or more eggs a year, it may doubtless be expected that the eggs from the heaviest layer would prove most infertile.

When stimulants are regularly fed to increase the egg yield, infertility may be immediately noticed in decreased percentage of eggs hatched, and the mortality in the chicks that are hatched. The few chicks hatching from such eggs will be weakened, sickly, and none of them will likely remain in the course of a few weeks. It stands to reason therefore that what prevents so many hatching must certainly affect the health of those that are hatched. In seasons when your eggs show a high percentage of fertility, the chicks will usually thrive well. On the contrary, take years when the eggs do not hatch well what will be the result: the chicks will be poor and weak, many living only a few days, and those that live longer will be more or less troubled with colds, swollen eyes and other diseases. The cause of the small per-cent. of fertile eggs and mortality in chicks can invariably be traced directly to improper feeding.

Does any of us know what proper feeding is? Experience will be the best teacher in this respect. We should try and bring the conditions as near nature's conditions as we possibly can. When a hen steals her nest and comes off with every egg hatched, those eggs certainly had the highest per cent. of fertility. Here nature had its own way and brought about the desired result. Now we ought to study nature's ways, and the nearer we get to its ways the better results will be.

In our efforts to obtain satisfactory results we should imitate nature as near possible, and where it seems to us that nature lacks one important factor, we should improve on it as far as our limited knowledge can conceive.

Fowls will not exercise for the sake of exercising. When given a full crop in the morning they will doze around until they are prompted by hunger to move. I have learned by experience that when given a full morning mash they apparently do not see the grain thrown in the litter for them.

Good results are obtained by different breeders through so many different methods that an attempt to give a fixed method of correct feeding would prove futile. However, a few things to be taken into consideration are the breed, ar breeds, kept, and the climate. A fixed ration adapted to one of the smaller breeds would perhaps bring highly encouraging results when fed to one of the heavier breeds.

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Correspondence.

— Sarragon Vinegar. —

Reply to "Clare."—The herb should be gathered on a dry day, just before it begins to bloom. Pick the leaves from the stalk and put them in a bottle with a wide neck, bruising them so that the flavour may escape. Cover them over with good vinegar, tie a bladder over, and leave in a dry place for a couple of months, then strain through muslin till clear, and put in a small well corked bottle for use. This is strong and must be used with caution. It is as a rule only used in advanced cookery for, e.g., Aspic jelly, etc. Use the best vinegar, such as Seppelt's.

— Chili Vinegar. —

Steep 1 oz. chilies in 1 pint vinegar for 10 days. Shake occasionally and decant when ready.

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Manufacturer of Plaster and Cement Ornaments, Fibrous Ceilings, Cornices and Arches a Specialty.

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The Competitions

Record - Breaking.

ROSEWORTHY.

Mr. Day has done many fine things with birds under his charge during the past few years, and it is a fitting climax to much good work that he stands to-day as the man responsible for the best record that the poultry world has yet known. In thus giving due credit to Mr. Day, we do not overlook the other factors in the achievement, either the hens or their owner; but it is only fair to remember that to so handle six Leghorns, which have been described as so many pounds of "fuss and feathers," at their very top speed for several months, is a great deal more difficult than some people would perhaps imagine, not only to keep them going, but to wind up with a spurt, thirty-eight for the last week, and one hundred and sixty-three for the last month, which is quite without parallel in the history of laying competitions. Breeders will, we know, join us in warmly congratulating Mr. Day on his share of the performance.

Mr. Walsh, the owner of the winning pen, has been very generous in his triumph, first in openingly acknowledging that his birds are of South Australian ancestry, being bred from parents purchased from Mr. A. H. Padman, who thus vicariously adds another success to the lengthy list already credited to him. This is, doubtless, good policy, for it secures to the Redfern birds a parentage which is beyond question, and entirely removes Mr. Walsh's success, from the category of "fluke." In recognising the value of Mr. Hart's assistance in selection, Mr. Walsh gives encouragement to fellow breeders in solving what is one of the knottest problems of competition work. There is, we believe, some sixth sense which is born, but cannot be shoved, into a man; not even if the shoving is attempted with the very greatest enthusiasm, and that sixth sense is the instinctive recognition of the possibilities of a bird or beast. Intuition is what makes the judge, whether he handles the large live stock, or the humble hen, bulldogs or butterflies, it is the same principal throughout. The moral of the last sentence or two is that when you find a Mr. Hart, it is good policy to love him like a brother, and take him home to tea. We may just mention that if he does not happen to be susceptible to such gentle persuasion, a couple of guineas would be well spent in securing his services. Although selection means much, and parentage more, there is something, and a pretty important something in between. This is where Mr. Walsh has scored. The Redfern man was in Adelaide a while ago, and described the methods by which he extracts a satisfactory proportion of the money which from time immemorial has been known to be secreted about the person or persons of domestic poultry. Broadly speaking, Mr. Walsh's methods may be said to be summed up in the words "Protection and care" as against the simple life and live or die methods which have been so largely advocated of recent years, as the only true road to stamina and—records. Mr. Walsh did not specify any particular, or, we should say, peculiar, methods of handling his chickens in the earlier stages of their growth. The unusual point comes in in the statement that the pullets practically lived their whole life under cover until dispatched to the competition. This would seem rather coddling preparation for such a severe test as is imposed by the winter months at Roseworthy. As chickens and growin stgock they appear to have been liberally fed, and the stout white oats in the scratching litter, which was plentifully supplied, seem to be a strong point in Mr. Walsh's methods of building up layers that last. "Layers that last by the way, seems to be an apt description of these birds—though we say it as shouldn't, perhaps—but it will be remembered that it was many weeks, indeed, months, before these birds came to be seriously considered as the pick of the bunch, and it was only after they got their second wind that they actually began to make things hum.

Another interesting point is, that they did not receive meat as part of their diet until reaching Roseworthy, and this, we believe, is contrary to the accepted practice of competitors, who usually begin to wind up their birds at four and a half months, or so.

It was, of course, a runaway win, a case of Redfern first the rest nowhere. We have not the figures at hand, but as far as we remember the Sunnyhurst Leghorns some years ago have been the only ones to put up such a break on their rivals.

In view of the comparatively poor score of the remaining hundred odd pens, it would be interesting to discover the cause of so general a failing. One hears many reasons suggested, but the one which appears to us most feasible is that discussed by "Hardshell" in the "Journal" some months ago when the birds were doing badly, at the commencement of the test. It was that the cold and backward spring of 1910 had delayed the maturity of the season's young stock. This would appear to fairly cover the ground, and is certainly more feasible than another theory we have heard advanced, viz., mainly that the whole South Australian strain of Leghorns had become weak and degenerate by "over breeding"—whatever that may mean. It is, of course, a little difficult to reconcile Mr. A J. Cash's Victorian pen with the bad weather idea, for there was surely nothing wrong with the place they came from. Still, this is, perhaps the brilliant exception which proves the rule. We are not, of course, forgetting Messrs. Moritz Bros.' fine pen at Kybybolite, but the fact that they were snugly houses for the winter months makes comparison difficult. Their score at Roseworthy of 1,289 seems to show that housing has considerable influence in total production. The bulk average this year is decidedly low, but owing to the high price of eggs and lower price of food,

"ONTARIO" WHITE LEGHORNS.

have twice won Roseworthy Egg-laying Competition.
World's Record for placing the first five pens in Blenheim Competition
1906-7, 100 pens competing.

I am offering eggs from Roseworthy winners at a very low figure to the first 20 applicants. This pen beat all Australasian Competitions held in open yards for 1908-9.

High class stock and eggs in season satisfaction guaranteed.
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T. B. BROOKS - - Clarendon.

the profits over cost of feeding does not show a corresponding decline.

The following are the names and scores of those pens which exceeded 1,200, which is in these days considered the limit, below which no pen with any pretensions to class can go, still a good many of them manage to do so sometimes:—

ROSEWORTHY FINAL SCORES.

Six pullets in each pen. Eggs laid for the month of March and the year from April 1, 1911, to March 31, 1912:—

— Light Breeds, White Leghorns (except where otherwise specified —

	Total.
Redfern P. Farm	1,589
Mrs. P. A. Uren	1,319
A. H. Padman	1,297
Moritz Brothers	1,289
C. B. Bertelsmeier	1,270
G. A. Collins	1,269
Range P. and E Farm	1,257
E. W. Hurford	1,256
C. A. Collings	1,240
A. J. Cosh	1,234
C. Hay	1,229
J. Ellery & Son	1,227
W. P. Eckermann	1,224
R. Carling	1,217
W. Purvis	1,212
P. Sickert	1,204
C. B. Bertelsmeier	1,202
Miss G. Purvis	1,200

In the heavy bred section owners have no doubt been seriously disappointed, for the following seven pens are the only ones which made even a respectable showing:—

— Heavy Breeds. —

Craig Brothers—Bk. Orp.	1,189
G. Toseland—Lang.	1,121
B. P. Martin—Bk Orp.	1,102
E. McKenzie—Bk. Orp.	1,084
S. Brundett—Bk. Orp.	1,068
Killara P. Farm—Bk. Orp.	1,047
E. V. Cant—S. Wyan.	1,021

In the light breed section, 1,200 and over, there are several new names, and Mrs. P. A. Uren is to be particularly congratulated on the excellent showing made by her birds. Mr. Padman, one, of course, expects to be at least as high as his name stands on this list. Messrs. Moritz Bros. are no strangers to one of the top places in competition lists. Mr. C. B. Bertelsmeier has, of course, been there before, only more so, for he was the joint holder of the South Australian record of 1,531, which Mr. Walsh has just upset. Other competition winners, Mrs. A. E. Kinnear, and Ontario Poultry Farm, are both so low that it is kinder not to disenter the actual figures. We hope that this eclipse is only temporary.

The following summary of results will be interesting to those of a statistical turn of mind. They will be found useful in proving more or less conclusively either that poultry pays or that it does not:—

—Summary of Roseworthy Results.—

Number of birds (126 pens), 756; total number of eggs laid, 133,093; value, £545 6/3; cost of feeding, £188 14/9; profit over cost of feeding, £358 11/5; average egsg laid per pen, 1056.29; per hen, 178.04; cost of food per pen of six hens, £1 10/; profit over cost of food per pen, £2 16/8; eggs laid by winning pen, section 1, 1,589; highest monthly score, 163 eggs; highest weekly score, 40; total weight of eggs laid, 17,323 lb.; average weight, 2.09 oz.

KYBYBOLITE.

Messrs. Moritz Bros. lead at this competition was not so marked as was the case at Roseworthy, but was nevertheless a very comfortable one almost from start to finish. It is interesting to note the relative scores of housed and unhoused birds entered by the same owner, and also the housed birds this year with those which competed last year under much more trying conditions. The value of adequate housing is plainly shown, though, unfortunately, the actual profit of so doing is not so manifest.

The folowing are the prize-winners in this test:—

— Kybybolite Prizewinners. —

Light Breeds.—Moritz Brothers, 1,464 eggs, £10; H. F & A. C. Vorwerk, 1,306 eggs; £5; "Mahama," 1,274 eggs, £3; J Jarrad, 1,196 eggs, £2; Sargenfri Poultry Yards, 1,191 eggs, £1. Heavy Breeds.—Mrs. D. McNamara, 844 eggs, £10; H. Bail, 783 eggs, £5; S. Staunton, 774 eggs, £3; A. Phillips, 748 eggs, £2; Mrs. D. McNamara, 717 eggs, £1. Prize for heaviest total yield of eggs, Moritz Brothers, Kalangadoo; score, 1,464; weight of eggs, 190 lb., £3.

BURNLEY.

It cannot be said that this competition started under very favourable conditions. There were many unsatisfactory rumours, and a whole set of disasters were foretold. However, the clouds rolled by, as clouds have a way of doing, and the Victorian Government, who organised the competition, through their expert, have the satisfaction of knowing that excellent figures have been put up, and that much renewed interest in poultry breeding has been aroused. Its nearness to Melbourne has been a point in its favor, and we read that immense numbers have visited the contest. Coming to figures the outstanding feature is that three pens have passed the 1,500 mark. This is the first time this has been done in competi-

KOONOOWARRA POULTRY YARDS.

Barred Plymouth Rocks: Ckl, 1st and Sp. at Victoria P. & K. C. Show; 1st and Medal Essendon Show, Vic.; 1st and Sp. Adelaide P. & K. Club Show, 1911; Hens and Pullets, all winners, P. & K. C. Show, Adelaide, 1911: 1st, 2nd, and 3rd Pullet, March Royal Show. Good Utility, £1 1s

Buff Orpingtons: Birds 1st and 2nd Ckl., 1st and 2nd Pullet, March Royal Show. Good sound color and healthy stock; also good winter layers and splendid birds for Export trade. £1 1s. setting.

Rhode Island Reds: America's leading utility birds, lately imported into Australia by me.

White Plymouth Rocks: Snow-white birds, easy to breed and rear, typical Farmer's fowl, good Winter Layers and excellent Table Birds. 1st and 2nd Ckl., 1st and 2nd Pullet, March Royal Show. £1 1s.

White Orpingtons: Imported and prize-winning stock. Won 1st Ckl, 1st Pullet Royal Show, Adelaide, September, 1910. 1st, 2nd, and 3rd Ckl., 1st and 2nd Pullet, March Royal Show. Great Winter Layers and good Table Birds. £1 1s. setting.

Pekin Ducks: Never beaten in show pen. Four Firsts, 1 Second, 2 Sp, at P. & K. Club Show, Adelaide, 1911, out of five entries. Two Firsts, 1 Second and Special at Royal A. & H. Show, Adeleide, Sept. 1910, out of three entries. A limited number of Settings at £2 2s.

I am now booking orders for breeding pens. I mate my breeding pens in June and will supply eggs for setting. Could not supply all orders last season. Book early avoid dissapointment.

Eggs securely packed and delivered on Rail or Coach (buyer pays carriage). Eggs All Stamped Kooneowarra. My Stodk won 23 prizes at Royal Show, March 2921
Terms: Cash with Order. I keep nothing but A1 Stock. I cull heavily and breed only from the Best.

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tion history. Mr. Pope, the winner, has the satisfaction of knowing that he beat the previous world's record by two, his score being 1,566. He was unfortunate, however, in that Mr. Walsh's pen over this side, had been even a little more busy, so that though he beat the old record, he does not hold the new one. Mr. Swift was the second, and he was well over 1,500; whilst Mr. A. J. Cosh, of South Australia, put up the third of the big totals.

— Hawkesbury. —

One always looks for solid results rather than sensational records in the Hawkesbury competition report. Mr. Thompson does not waste time over abstract problems, but gets down to the bones of the matter in very few words. One point of great interest during the last competition has been the test carried on between ten pens meat-fed, and ten pens fed no meat—all being of the same breeding, and the management and feeding being the same. At the commencement of the test the opinion was freely expressed that the no-meaters had not even Buckley's chance; now, however, that the numbers are up there is quite a different story to tell, and the figures are certainly instructive. It would, of course, be a mistake to take the figures as final, but they are certainly an indication that too much stress has been laid on the meat ration for poultry.

The test was for a period of twelve months, and finished on March 31, with this result:—

	No meat.	Meat fed.
Total eggs laid	11,112	11,665
Average per hen	185	194
Market value of eggs per hen	18/10	19/4
Cost of feed per hen	5/10	6/1½
Profit over feed per hen	13/	13/2½

As regards the general condition of the hens at the finish, the conductor says:—"No appreciable difference was to be noted at the close.

For several years the test of the relative laying of first, second, and third year hens has been carefully tested, and much that is of interest has been observed and recorded. The accumulated results may be said to indicate that on the question of profit there is little difference between the first and second year hen, taking into account, of course, the first six unproductive months of the hen's life. To anyone contemplating poultry-keeping on anything like a large scale the settlement of questions such as these, is of very great value. The actual figures for this year are as follows:—

Average eggs per bird—first year, 300 pullets, 184; second year, 180 hens, 140; third year, 60 hens, 130.

Profit over cost of food per bird,

First year, 300 pullets, 8/7; second year, 180 hens, 8/3; third year, 60 hens, 5/8.

THIS YEAR.

The record entry for the present competition at Roseworthy is a fairly solid answer to those who predicted a year or two back that interest in competitions was on the wane. As far as the general public is concerned, it is probably correct, but any test which can draw competitors from all parts of the Commonwealth, including the Victorian Invading Army, is doing good work for more and better poultry. We do not believe that it can be maintained, that our competitions, as at present conducted, are doing the most possible good for the industry. It may, of course, be true that what is being done at Hawkesbury need not be duplicated elsewhere. That argument is, however, we think, fallacious, and in any case there are many problems in poultry work. We hear that the birds sent up are, if anything, a more representative lot than has been the case in any other competition. Competitors at last appear to pretty generally understand that maturity as apart from actual age is an important factor. To those who have commenced well we wish good fortune, and to those who have not commenced, a little bit more of the same.

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Large tins, 7/6.
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Clean the fowlhouse out regularly and often, and do not leave the sweepings where the hens can get at them and scratch them about. Burn everything to get rid of the vermin, or else take it away to the compost heap, or dig it into the garden.

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DON'T LET HIM HAVE IT.

Pigeon Notes.

Pigeon Notes.

By "Carrier."

By this time many of the birds are about through the moult, whilst the late ones are well on the way. Manure does a lot for our pets, but what crazy pranks it plays on us. Just a feather here and there; will we take up the scissors and try to persuade ourselves that if it is not quite honest. All things are fair in love, and of the pigeon shows some, of course, hold different views, and try showing their stuff as nature makes them, but this often means a really good pigeon badly shown losing to a very inferior specimen. Why don't pigeon societies lay down some different ruling on the subject of trimming, which to a certain extent is a necessity.

I have just received the schedule for the forthcoming C. and P. show, and find it comprehensive in classification. I notice the society has made a new departure in naming judges; this is, undoubtedly, a move in an honourable direction. I always hold that the exhibitors should have the right of knowing when entering birds for competition who is to adjudicate, for I think that at various times we all have our misgivings as to the ableness of the judge, and it is far better to keep our birds at home than to sicken our friends with our opinion of the judge. Whilst we freely admit the judge's ability to err it must be considered that he spends both time and money on his studies and receives little but abuse by way of reward, and although the abuse ofttimes amuses it does not clothe the back nor keep a bit of 'baccy in the pipe.

Some time ago Mr. Baulderstone invited me to his loft to see a pair of White Fantails (recent arrivals from England) I availed myself off his kindness, and spent a very pleasant time whilst in his company. The Fans are from the well renowned lofts of George Grey, England's premier breeder of White Fans, and should prove very valuable to their new owner and to the fancy in general. No doubt to many the birds will appear as a bit on the big side, but they are good big ones, and so you will say when it is your pleasure to see the. Although usually length of feather brings about two great faults, namely, too great a length of both neck and legs. These birds whilst having a good length of feather both are on well set legs of right length and put their heads down fairly well on the best of cushions. Added to this the pen has a grand spread of tail, but here the cock rather fails. After remarking, the hen had rather the better eyes of the two. The owner put the cock on the ground; of course, it is here the correct length and set on of legs tells its tale, and in a very little while he was into action. His deportment is about perfect, but would like to see him shape a bit more than he did. In summing up, I can't remember ever seeing a Fan that could walk like him. Before closing I think it is an opportune time to impress on the various show directors in S.A. the advisableness of providing a walking pen for judges' use in judging their Fans, for it is here that one bird may prove his real quality, while another—when the judge is stationary on the bench—goes back with a rush, and, again if Fans, Pouters, and Pigmies were put into a walking pen at various times during the show many visitors would be so delighted with the display that the above varieties would claim a few more followers.

Fanciers will be pleased to welcome back to the Fancy the following gentlemen:—Mr. L. E. P. Smith (who still keeps his homers; talks of taking on either Antwerps, Dragoons, or Pouters; Mr. Whitrod tells me he thinks Magpie (by, the way, I am sending him to Mr. Koerner, who has lately done so much for this breed by putting many of his high-class Magpies at the disposal of the S.A. fanciers at bedrock prices). Jacobins and African Owls will claim his attention. A grand old fancier of the long ago, Mr. Gavin Ritchie, has taken on the short-faced Tumbler.

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PIGEON SPECIALISTS,

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MAGPIES, JACOBINS, HOMERS, NUNS.

Prices to suit all purses.

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BALACLAVA, Victoria.

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Have some real beauties to sell in TURBITS, BLONDINETTES, AFRICAN OWLS, NUNS and S. F. TUMBLERS.

These lofts have won CHAMPIONS at Sydney Royal, also CUPS, and MEDALS at S.A. Canary and Pigeon Show and a host of SPECIAL, FIRST and SECOND PRIZES.

Prices from 5/- each.

Apply—
E. A. GROSSER.
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Victorian Notes.

(By J. G. M.)

This month sees the first Victorian show—the fixture at Northcote. As a rule there have not been very many pigeons in this show of late years, although the poultry is always very much in evidence. However, I hear that there is the greatest hope held out for a good entry this year, and I for one expect that this will come about.

There are one or two people in Vic. who are going in rather extensively for squab breeding just now, but I cannot say that I have heard any progress reports as to their success or want of success. As far as I know we have not in Australia any Mondain pigeons, which are one of the recognised birds in Europe and America for squab production. But, as far as I am concerned, if I were taking up this industry, I would be inclined to try a cross between show homers and Dragons, always breeding from the largest birds, and, of course, giving regard to fecundity. The Mondain pigeons, I should have said, are a cross between the Runt and Dragoon. Failing either of these crosses no doubt the best results would be got from large-sized Homers.

As I have before said in these notes, there is some excitement over here in the Fantail world, and it is to be hoped that the mountain will bring forth something more than the proverbial mouse. I will say that the right people are the ones doing the talking, so I am also on the tip-toe of expectation. Meanwhile, I would like to say that a day or so ago I had the privilege of seeing the best magpie I ever saw in Australia, and locally bred at that. I shall take off my hat to the bird that beats it!

I can introduce fanciers who want to buy any of the following breeds to men who have quantities to sell: —Homers, Jacks, Beards, Magpies, and Fantails.

If secretaries of shows outside Victoria will kindly forward me schedules I will see that the fanciers at the Victorian Pigeon Society meetings get them.

Readers! **Can you write us something about your methods of breeding, rearing, and managing Live Stock? Let us have it if it will only fill the back of a Post card.**

Home Notes.

Yawning.

Yawning is good for you. Artificial yawning, says a throat specialist, is more helpful in some cases than the best gargle. During the act of yawning there is a considerable stretching and exercising of the muscles of the pharynx and soft palate. On these muscles the yawn acts as a massage. Furthermore, yawning contracts the throat tubes, and drives from the pharynx any waste matter that, accumulating there, may have impeded the breathing. Nothing clears the throat like a yawn.

Helps in the Laundry.

The best and easiest way to clean dirty overalls that are worn by the men on the farm, is to soak the garments in a little lye water, then wash them through the last suds. Pull them up over the washboard and scrub with a stiff brush with a handle, but rub soap over the most soiled spots first. It is easier than rubbing on the board, and every bit of dirt comes out. When a garment seems clean after the scrubbing lift it out of the suds without wringing into the rinse water, then into clean water and hang it over the line dripping wet, and when the garments are perfectly dry, fold smoothly and put away without ironing, and when they are cleaned in this way the fabric will be saved as well as time and strength. As to laundry soap, it is never economy to buy a cheap and poor grade, and if bought in quantities it should be exposed to the air and dried well before it is used.

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THE RELIABLE GROCERY STORE,

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Quilts can be washed without fear of the colours fading by adding three tablespoons of turpentine to a half tubful of water, and then putting the quilts in this water to soak for half an hour before washing; then they should be washed quickly through a strong suds of white ivory soap and warm soft water, and nice coloured garments may be kept fresh and new looking by washing in same way. When partly dry unpin the quilt and turn it upside down and dry with the wrong side to the sun, and stretch and pull them while drying, so they will dry smoothly and there will be no danger of them streaking or fading.

There is nothing which requires so much care and never-failing particularity as the flannels. No inexperienced person should attempt the task, for it lies in the power of the laundress to keep them dainty and soft, or to utterly destroy them and make them unfit for further use. There are many conflicting theories in regard to the proper way to wash flannels, but the best and safest rule to follow is to wash them in soft water just hot enough to be borne camfortably by the hands. The suds should be made before the flannels are put in, and soap should never, on any account, be rubbed into them. Neither should the flannels themselves be rubbed, as in washing linen articles, for the fibres of the wool contain numberless little hooks which the rubbing knots together, and, consequently, this is followed by the thickening and shrinking of the fabric.

If they are very much soiled they should be washed in two suds of the same degree of temperature, then rinsed in lukewarm water, into which a little blueing has been thoroughly stirred. Shake the articles up and down in the water, and pull through the hands, and after each water squeeze as dry as possible with the hands, as the wringer might have the tendency of making them harsh and unpleasant to the touch.

The flannels should then be well shaken and pulled into their original shape, and put out into the sun to dry as quickly as possible. Before they are quite dry they should be brought in, pulled and folded as evenly as possible, then rolled up tightly in a clean cloth or towel for a short time—if left too long they will shrink—and then they should be pressed till they are quite dry.

White flannels and blankets washed in this way will remain soft and white till they are worn out.

When at all possible, flannels should be well shrunk before being made up, and care should be taken to avoid a gloomy day for washing them. If it is cloudy or stormy weather, and the sun does not shine, it would be much better to dry them indoors.

To Clean Feathers.

A feather may be washed in good, hot, soapy water. Smooth down towards the tip till all the dirt is removed. Rinse in clear water, and dry in front of the fire. To curl, use an ivory, a silver, or a wooden paper knife. Take hold of the extreme tip of the feather, and then scrape the knife firmly along the rib underneath, so as to curl it. Then curl the understrands, and finally the tip. Sprinkle a little salt over the feather when you have been all over it, and shake it gently in front of a hot fire. There may then be a few stray strands that want a finishing touch to make the whole feather look full and well curled.

A Ruling Passion.

TIDINESS.

"I have not seen one woman, but many women, almost sacrificed at fierce fires by their desire to be tidy even in the face of death," remarked one of the most experienced firemen in the London Fire Brigade.

"I shall never forget one fire in the north of London, though this is an extreme instance of what I have been speaking of. While I stood—flames almost licking me—with a blanket torn from the bed in my hand, a girl shop assistant, about whom the crowd down below was roaring and shrieking in alarm, calmly fastened the band around her gown and began to loop up her hair, though flames had actually begun to burst in at the windows on either side of the mirror she stood before. I absolutely tore her away, and in spite of the fact that she nearly sacrificed my life and her own, I always laugh when I think that at the time I roughly grasped her she had two hairpins in'her mouth, and nearly swallowed them at the suddenness of my action.

"My superintendent often tells of a young woman in Holborn who, after a dreadful explosion of gas—and when surrounded by flames—first of all raked up all her trinkets into the pockets of an overall she had donned, and then gave her face several dabs with a powder puff. She and the superintendent were got out with great difficulty.—Exchange.

Cooked Foods.

There is no doubt that cooked, that is boiled or steamed, grain is more digestible than raw. Cereals contain 60 to 70 per cent. of carbohydrates, which consist almost entirely of starch. Starch itself is indigestible, but cooking converts it into sugar, and renders it more readily digestible. Its feed value is in this way increased. The animal not only gets more nourishment out of the same volume of food in a given time, but out of the same volume a greater quantity is assimilated. At the same time it is not wise to feed an animal entirely on cooked foods, as they do not promote the flow of the gastric juices in the same way as raw foods. The cooking of grain foods results in more complete absorption in digestion, but an animal does not live entirely on predigested foods. There must be something for the stomach to do, and therein lies the importance of having bulk or a certain propotion of waste matter in foods.

"Self-Helper" for an Invalid.

Most people have seen the convenient arrangements in hospitals by which helpless patients can move in bed without having to call for the nurse. In one's own house such contrivances are not possible, but willing fingers can make quite a good substitute for the poor home invalid. A length of rope is required sufficiently long for the patient to catch hold of its centre with ease. The rope has a strong loop at either end, which slips over the knobs of the bedposts. Rope is not the softest thing for delicate fingers to grasp, so the place where the invalid will take hold has about half a yard of the rope covered first with wadding and then with soft knitting. A long piece of garter-stitch knitting suffices for this, and when completed it is folded round the wadded rope and joined along the two edges.

This simple plan is a comfort to the patient, and by enabling him or her to move from the one position creates a feeling of independence, and the happy inner conviction, "I'm sure I'm getting stronger."

Jarring and Nerve Diseases.

Up-to-date science tells us that vibrations play an enormous part in the world of life. A little thought will show the least learned reader that they affect us for good and ill. I am concerned only with the bad variety. A touch of the nerve keys is followed up by a little hammer striking inside the brain. People ride motor cycles until they get into such a state that when asleep the shocks go through their spinal column. There are countless means by which such mischievious vibrations are experienceed. Thence come all sorts of nerve ailments, including neuralgia.

Hints to Housekeepers.

When a woollen skirt has been wrinkled in packing or any ather way, it can be made smooth by hanging it out of doors in the dampness on a day when there is not too much moisture.

Silk may be restored by sponging. and while quite damp it should be rolled on a broomstick and left until quite dry. This may take twelve hours or more. Silk should never be ironed.

Ink spots are removed from gingham by saturating them with sweet milk. then covering with salt. Salt and lemon juice will remove mildew. Soak brooms occasionally in hot water; they will be softer, less brittle, and will wear longer.

Ammonia is very useful in the household. A few drops put into water and rubbed on unwashable clothing which has become soiled, will remove the dirt without injuring the garment. It is also excellent for cleaning hair brushes and combs, paint and marble.

When the prudent woman removes her veil she rolls it between newspaper over a rod as long as the veil is wide. A broomstick cut a proper length makes a good roller. If the veil has lost its stiffness it may be made like new by dipping it in a very thin solution of gum arabic, being pulled straight before it dries.

Washing clothes is not wholly a matter of friction, but a great deal more washing and less friction would be more effectual and more agreeable to the worker. The boiler must be freed from iron rust, and the water as clear as possible, and if necessary put into the boiler one tablespoonful of borax. The clothes should be put on in boiling water, and allowed to come to a boil. This disinfects the fabric and helps to rid it of the soap.

Can Women Make Dresses?

What is the reason that dressmaking—so essentially a woman's work—is better done by a man than a woman; All the best dressmakers are men, and ladies' tailors are getting more popular than ever. A well-known ladies' tailor—one long established in the West End of London—explains the phenomena: "I have never yet," he says, "been able to find a woman who would recognise the difference between the sixteenth and the eighth of an inch. You cannot make a woman understand that a variation so minute makes all the difference between a fit which is excellent and another which is merely very good."

The Milk Cure.

"For twenty-three years I have never eaten any solid food, my only diet has been three gallons of milk a day." Dr. Hermann Schwartz, an Austrian physician now visiting London, made a statement to a representative of "The Tribune." A diet of milk seems to agree with him, for he looked in the pink of condition, and as healthy and sturdy a man of fifty as could possibly be found.

Dr. Schwartz has a milk sanatorium near Vienna. His house, he says, is always crowded with patients who have run down and want to recover their weight. There is no getting up for breakfast at his establishment, or dressing for dinner. Breakfast, dinner, lunch, tea, and other meals thrown in, come round to each patient in a nice white milk pitcher, with a

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mug beside it. His theory, he says, is founded on a scientific knowledge of the value of milk as a food . He has made the effect of milk upon the human body his life study, and consequently considers milk the basis of proper nourishment.

He does not say that people should stop eating for ever. On the contrary, he prepares his patients to go back to their normal life. They stay with him for months perhaps ; then some night, after dining on the evening's meal, they go home, and wake the next morning to coffee and bacon.

Milk and rest and fresh air, sleeping —sleeping indoors and out—these are the tenets of the milk cure. For tired people there is something in the very thought of it.

Sawdust Promotes Health.

The dust from pine wood, deal, and many other kinds of timber yields aromatic compounds to the air that refresh a sick person, help to get rid of microbes, and disguise the stale odour so common in sick rooms. The sawdust may be spread on the floor, on trays. Some people spread it on a rather deep tray, and moisten with boiling water. If sawdust is mixed with a little saltpetre, and fired, it may prove helpful in asthma. The smoke should not be brought near the patient until relief has been experienced by its having been inhaled in the diffused state.

Treatment of Measles.

As a rule, the treatment of a case of measles is of a fairly simply character, the one great point which should be impressed upon the mind of the mother being that the risk of cold and chill should be avoided. In the case of many diseases, as, for example, in kidney troubles, the avoidance of chill affecting the skin is a point of the highest importance. This is so also in the case we are considering. Any exposure to cold of a patient suffering from measles is apt to be attended by the development of serious complications, leading frequently to death itself. The patient's bedroom, it is advised, should be kept dark. The diet will consist largely of milk. The state of the bowels requires constant attention by way of reducing the fever, and medicines are as a rule limited to the giving of some simple mixture which will cause the skin to act. If there is a distaste for milk, a little beef tea may be given. One physician remarks that a child who refuses milk may be given a little tea, or milk along with tea. There can be no objection, it is added, to giving a child a little bread or biscuit dissolved in the fluid. A well known mixture to act upon the skin may be given until the eruption fades away. Such a mixture may be composed of—spirit of nitrous ether, two drachms ; liquor of acetate of ammonia, two ounces ; syrup of saffron, one ounce, and water up to four ounces to be labelled—a teaspoonful to be given every two or three hours to a child from two to four years of age. If there is much itching, due to the rash, sponging the parts with tepid water, in which a little bi-carbonate of soda has been dissolved, wil, generally relieve this symptom.

Onion Cures.

Onions supply a complete cure in themselves for colds, as well as being a wonderful remedy in cases of insomnia. An onion breakfast includes a poached egg on toast, three tablespoonfuls of fried onions, and a cup of coffee. Luncheons of sandwiches made of brown bread, buttered and filled with fine chopped raw onion, seasoned with salt and pepper, make the second meal of the schedule. For supper the onions may be fried as for breakfast, and eaten with a chop and baked potato. The efficacy of onions is well known to singers, who eat them every day to improve the quality of their voices and keep them smooth. Onion plasters are prescribed to break up hard coughs. They are made of fried onion placed between two slices of old muslin. The plaster is kept quite hot until the patient is snugly in bed, when it is placed on the chest, to stay overnight. Onion syrup is claimed by some to be unequalled as a cure for a bad cold in the chest.

How to Treat Oilcloths.

In an interview with the manager of an establishment where oilcloths are sent out in great numbers, he said, " Scrubbing brushes, soap and soda make our trade brisk."

" You mean me to understand that these three things spoil the cloth ?"

Decidedly. Also, I will tell you water rots it. Many a time have I seen the men obliged to scrape the rotten cloth from the floor with a knife ere laying down a new floor covering, and I have always said to myself, " Sloppy cleaning.' "

" But how are we to clean it ?"

" Use as little water as possible, and never a scrubbing brush or soda under any circumstances. A floorcloth kept well brushed will last a long time without other cleaning. " Keep it clean with brushing as much as possible, and lay mats where dirty feet are apt to tread. Have felt laid under it, so that uneven boards and cracks do not work a hole through—layers of brown paper answer the same purpose as felt. Lye enters into the manufacture of oilcloths, and therefore ammonia cleanses and preserves at one and the same time.

" If the cloth gets exceedingly dirty, say by a sudden influx of muddy feet, wash it over in warm water, to which has been added a teaspoonful ol ammonia to two quacts of water. Use a big, soft cloth, and, above all, be sure to wipe perfectly dry with a dry duster. I have seen careless servants slop a wet cloth over the surface, splash a soapy scrubbing brush after it, and then wipe up and go away, heedless of sundry little pools left to rot into the cloth. To me this is aggravating, for then the maker of the oilcloth comes in for a share of blame. ' Dear ! dear ! ' says the owner. ' Only had the oilcloth down since Christmas, and how shabby it looks. Must deal elsewhere ! '

" For ordinary cleaning I recommend milk, to which has been added a little ammonia, for this is a cleanser that acts well. Ordinary furniture polish or beeswax and turpentine, is used by many people with good effect."

One of the Golden Rules.

The following is one of the "Twelve true old golden rules of domestic economy":—She who roasts or broils her meat wastes half of it on the fire. She who boils it loses a considerable part of it in the water. But when the good wife stews her meat gently, thickening the liquor with a little meal ground rice, or peas and vegetables, making it savoury with forced onions, herbs, and seasoning, her husband and she fare much better, their children thrive and grow hearty and stout, and their money goes twice as far.

◆

Whilst sitting in a theatre, one often hears the youthful appearance of the actors and actresses remarked upon. The reason is not far to seek. It is due, not so much to the grease-paint which is used in making-up, which certainly does take the natural wrinkles in the face out, and at the same time lubricates and nourishes the skin, as to the change in the expressions of the various emotions which every part demands. This constant changing of the expression on one's face brings into play the various muscles of the face, and by doing this they all maintain their strength, and do not waste away on account of disuse; the result being that the skin of the face is kept stretched, and thus does not fall into hollows.

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